

Installation & Maintenance Manual

**Airsweep Models
VA-06 • VA-12 • VA-51**

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AIRSWEEP® INSTALLATION NOTES

Consult installation drawing (if provided) for proper Airsweep location. It is important to adhere to the recommended locations as the type, number and location of Airsweeps have been selected for thorough "sweep" coverage of the problem surfaces in bin or chute.

It is usually not necessary to clean out or empty the bin before installing the Airsweeps. Even if a "crust" or material has built up inside the bin, the air blasts will generally cut it away from the bin wall over a period of time.

However, the "crust" sometimes breaks away in chunks, and it is possible that these chunks will clog the discharge. If so, the bin should be cleaned manually prior to start up.

CAUTION: NEVER ENTER A BIN WHILE AIRSWEEPS ARE OPERATING.

If the material in the bin would have a tendency to run out of a hole cut in the bin wall, the level of material in the bin should be dropped below the Airsweep location before cutting the holes in the bin wall.

When welding, a continuous bead should be used to fasten the mounting to the bin wall on steel bins. On concrete bin walls, anchor bolts can be set in the concrete to coincide with the bolt hole pattern of the mounting plate or flange, so that the mounting can be bolted to the wall.

PIPING INSTALLATION

Follow the piping schematic that is a part of this instruction manual.

Never use smaller pipe size fittings or valves than the ones shown.

It is important that the header be installed below the level of the Airsweeps so that any condensation that may form in the lines will not drain into the Airsweeps. If the header must be installed above the level of the Airsweeps, the feed lines for the individual Airsweeps must be taken off the top of the header (rather than the bottom) to minimize condensation drainage into the Airsweeps and solenoids. A full flow gate or ball valve is recommended as it allows one Airsweep to be taken out of service without shutting down the entire system.

Using flexible air hose in lieu of rigid piping from the header to the solenoids is recommended for ease of installation and for easy removal of the Airsweep when service is required.

NOTE: USING SUITABLE SAFEGUARDS, always blow out all air supply lines thoroughly before final hook up to solenoids. Dirt in supply lines may cause the solenoid valves to malfunction.

When operating properly, and under material, the Airsweeps are almost silent. If an Airsweep begins to chatter, vibrate or "machine gun", it is generally caused by a solenoid valve malfunctioning due to dirt. If this occurs, **SHUT OFF ELECTRIC & AIR SUPPLY** and **DISCHARGE AIR** in system, then clean solenoid thoroughly (see troubleshooting).

AIR USAGE NOTE

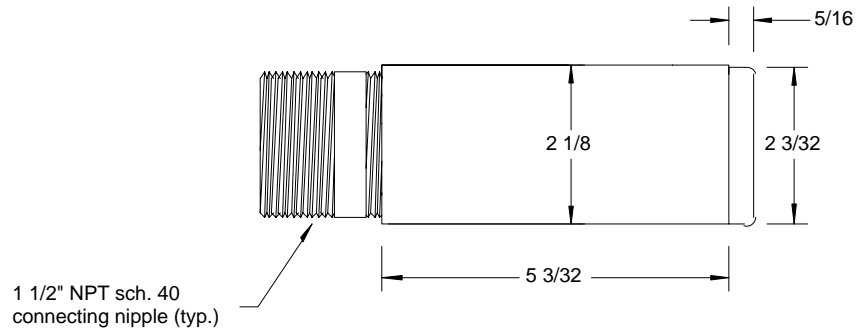
It is important to note that the lower limit of the interval timer is governed by how fast the air receiver can recover its air loss from the preceding Airsweep burst. If there is some doubt, a gauge should be installed on the air receiver tank or header. For example, if the gauge initially reads 95 psi when the receiver is fully pressurized, it should not drop below 80 psi for one burst if the receiver has been properly sized. The instant the receiver again recovers the 95 psi after one Airsweep is fired, it is then ready for another firing. If the gauge never indicates the original pressure, the Airsweeps are firing faster than the air supply can recover.

GENERAL NOTES & SUMMARY:

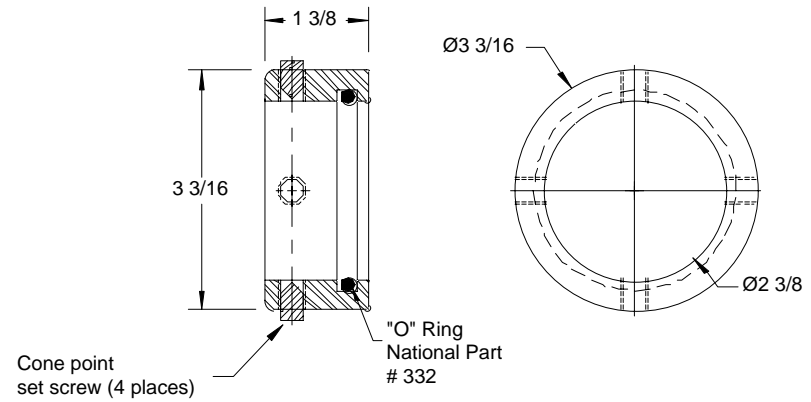
- Entire electrical system must be properly grounded for personnel safety.
- Distance between air receiver and header has no limit as long as 2" pipe (1" for VA-06) & fittings are used throughout.
- Slope header toward receiver 1/4"/ft. for moisture drainage. Whenever possible, locate header below Airsweeps.
- Always tap feed lines off top of header (even if header is above Airsweeps) to prevent moisture drainage into Airsweeps.
- Never use pipe or fittings smaller than sizes indicated.
- Use location arrangement drawing (if provided) for Airsweep location.
- Whenever possible, complete header loop around the hopper.
- Manual isolation valves (optional) must be gate valves or comparable full orifice valves, to not induce flow restriction in system.
- If hopper is outdoors, air receiver and filter should be located indoors whenever possible.
- Check valve recommended if plant air pressure varies more than 10 psi.
- Air Supply: VA-12 & VA-51 - 80 min. to 100 max. PSIG
VA-06 - 40 min. to 80 max. PSIG
- IMPORTANT! Solenoid valves must be located at Airsweep air inlets and not any distance upstream.
- Purge all lines and unions before connecting to solenoid valves. Particulate in lines may result in solenoid valve malfunction and excessive maintenance.
- Use teflon tape on pipe joints rather than pipe dope, to avoid fouling of solenoid valves.

VA-51 Airsweep[®] dimensions (no scale)

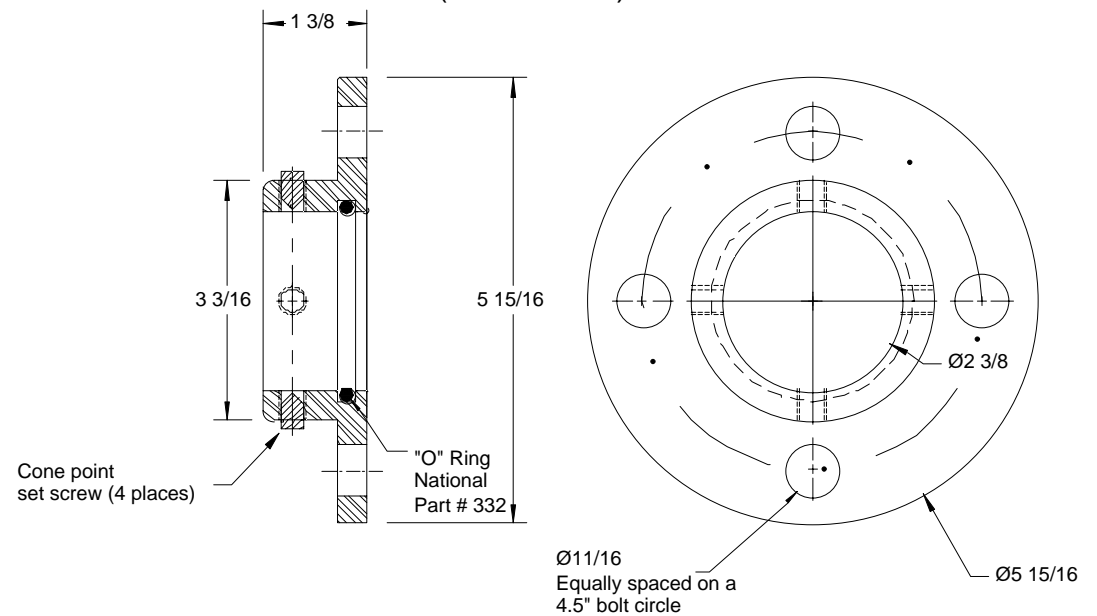
VA-51 Airsweep



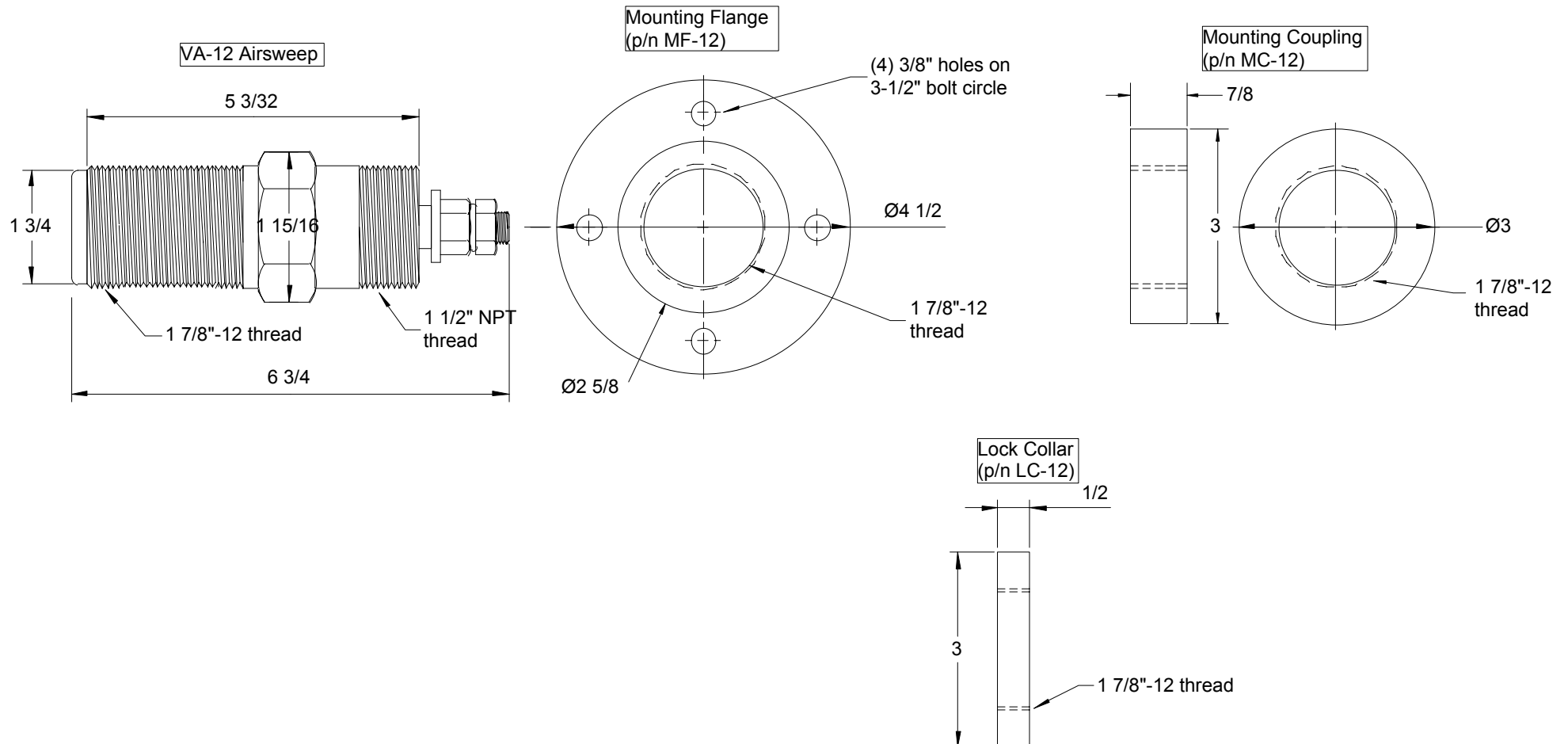
MC-51 Mounting Coupling
(for curved walls)



MF-51 Mounting Flange
(for flat walls)

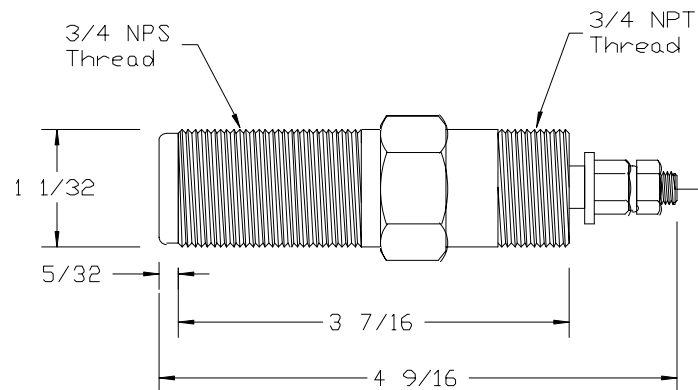


VA-12 Airsweep and Mounting Options (all dimensions in inches)

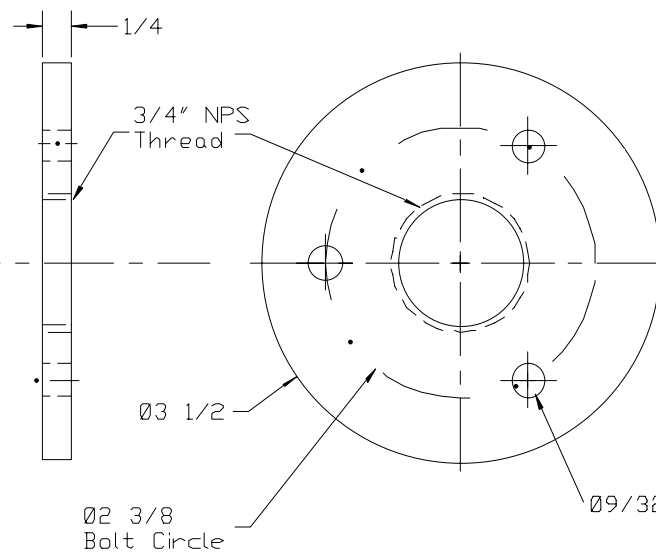


VA-06 Airsweep and Mounting Options (all dimensions in inches)

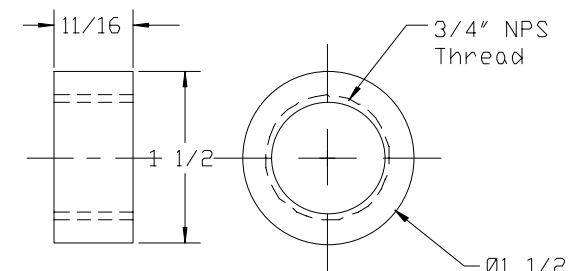
VA-06 Airsweep



Mounting plate for flat surfaces
(Bolt or weld to bin)



Curved surface Mounting Coupling
(Weld to bin)



MYRLEN CBO-SERIES AIRSWEEP CONTROL BOX

The control box is the heart of the Airsweep system. It is this device which fires the Airsweeps in a prescribed sequence and at a prescribed interval to assure on-demand or even discharging of material from the bin, silo or chute. **The firing order is from the discharge (lowest unit) and up.**

The burst signal, sent from the control box to the solenoid valves, is typically set at 0.25 seconds. It is this signal that is responsible for the actual firing of any given Airsweep. In some cases, more than one solenoid valve may be wired to the same output, to effect simultaneous firing of two Airsweeps.

The interval timer governs the "dwell" between successive firings.

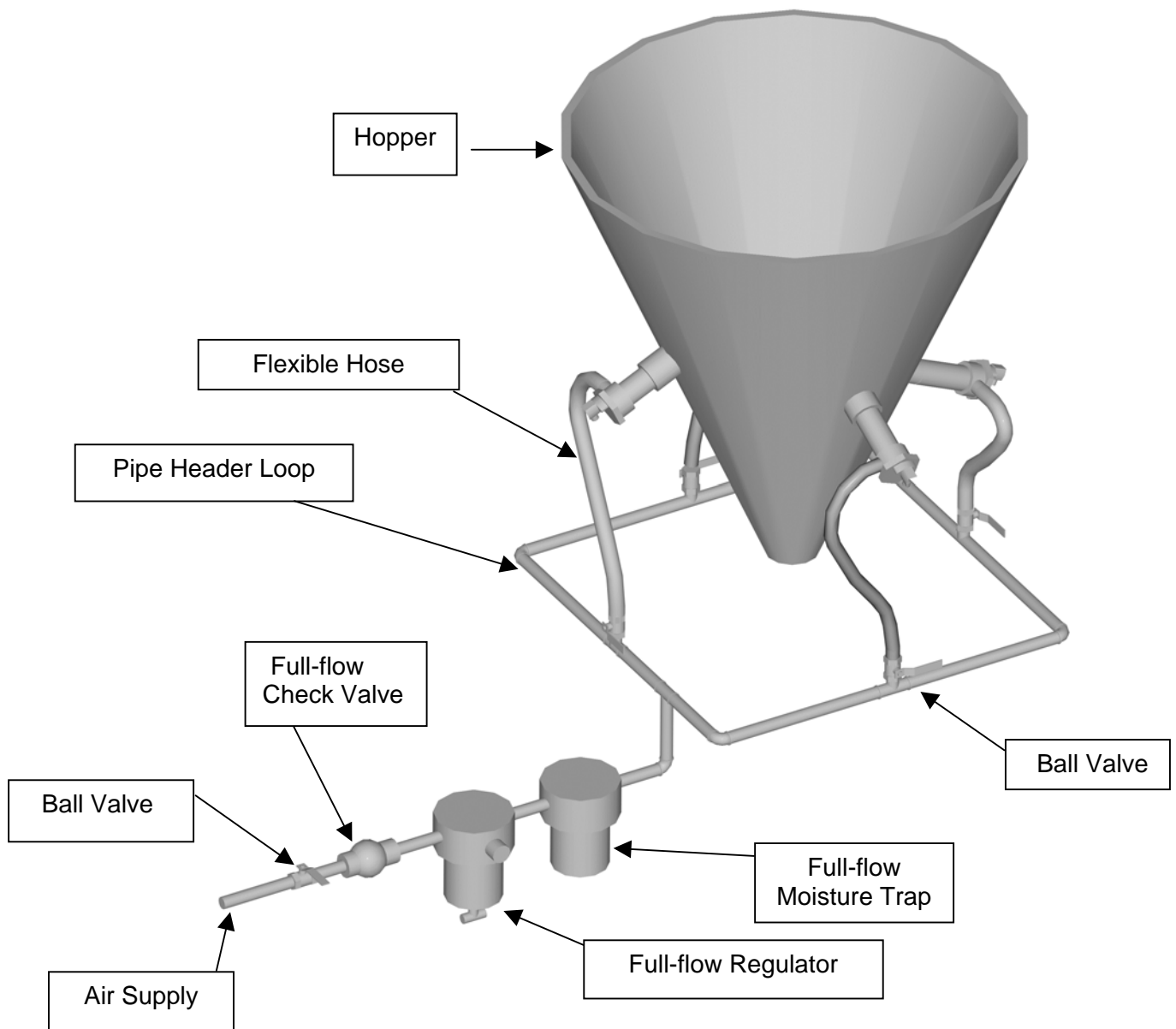
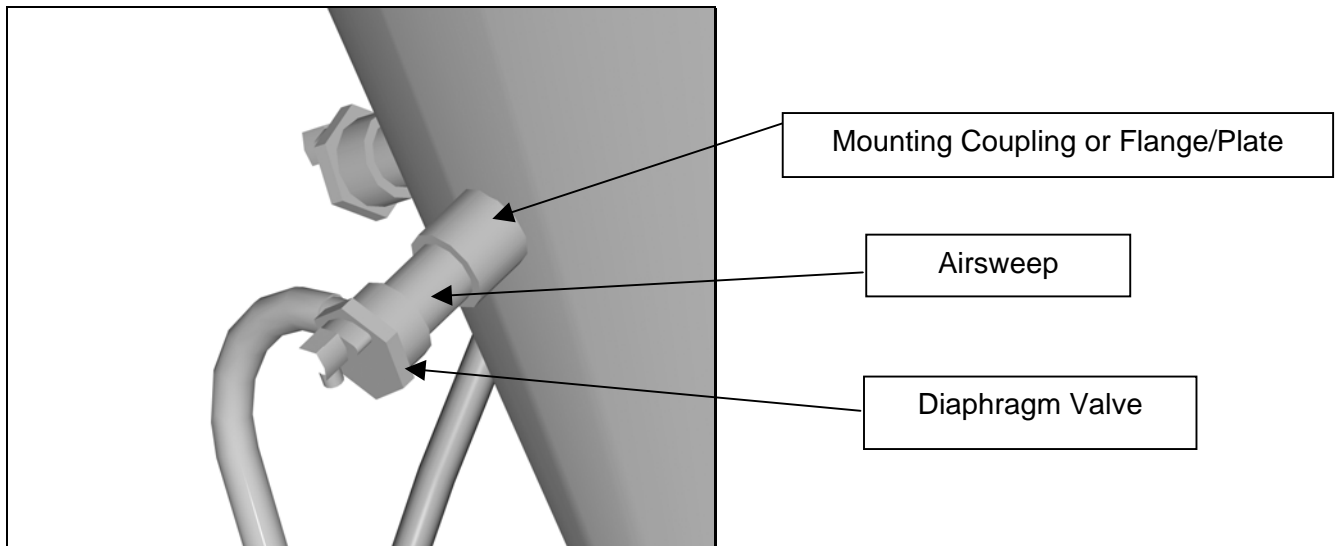
The "dwell" should be set as long as possible without adversely affecting the flow of material. **A longer "dwell" will conserve air.**

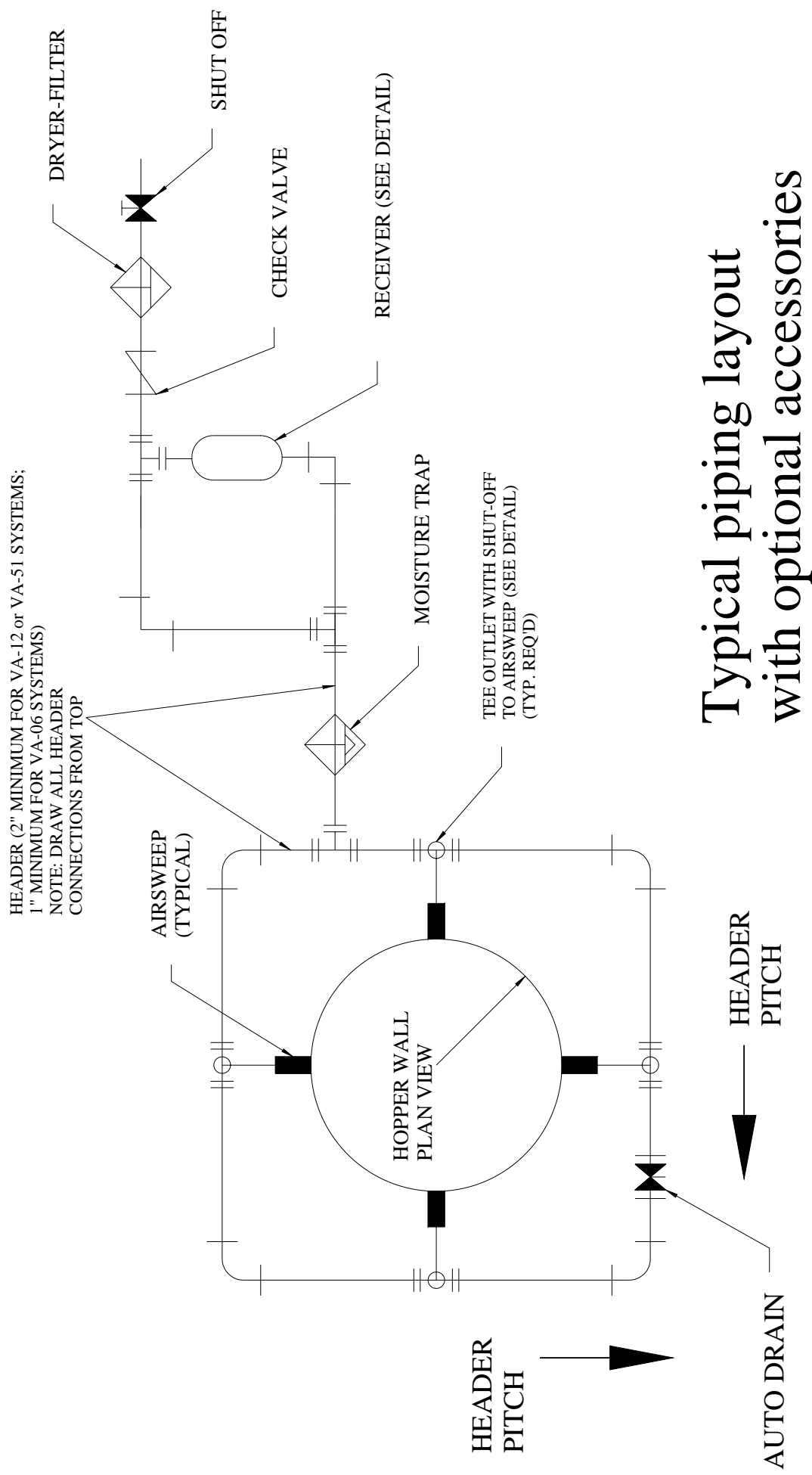
External controls, if included on the control box, consist of a rotary ON/OFF switch and a push button labeled "JOG". The "JOG" button is intended to provide manual assistance of rapid firing of the Airsweeps in times of unusual material hang-ups or when increased material flow is required.

WARNING

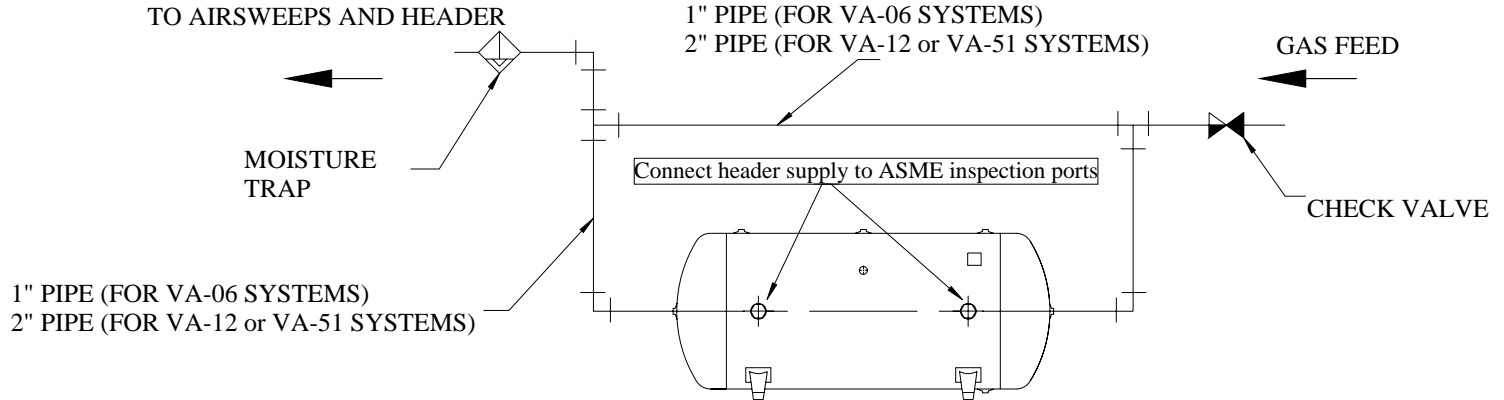
**NEVER ALLOW ANYONE TO LOOK INTO OR ENTER
BIN WHEN AIRSWEEPS ARE OPERATING.
EYE OR OTHER INJURY MAY RESULT! SHUT OFF
ELECTRIC & AIR SUPPLY TO AIRSWEEPS AND
DISCHARGE AIR IN SYSTEM BEFORE INSPECTING
OR SERVICING AIRSWEEPS.**

TYPICAL SYSTEM COMPONENTS

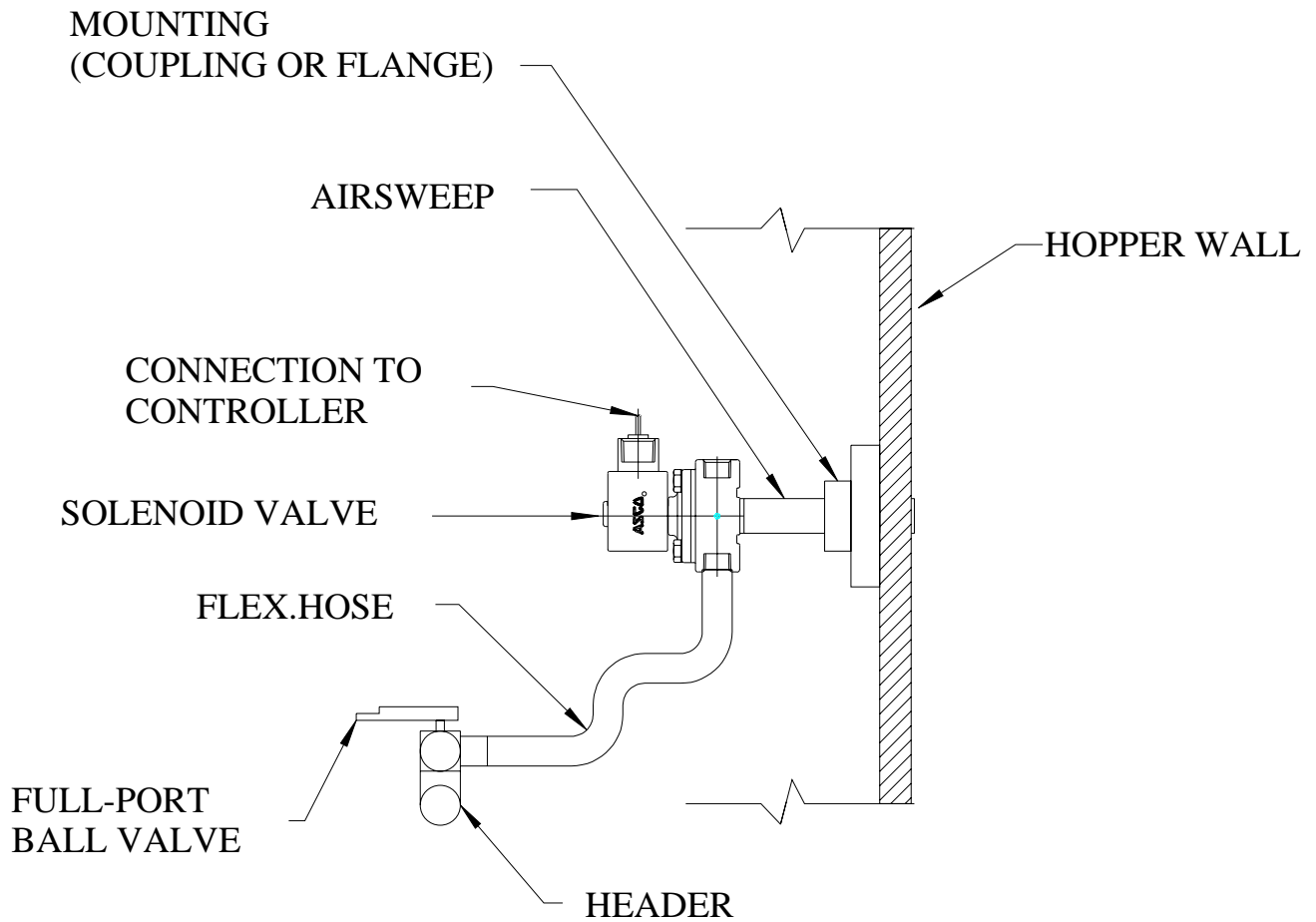




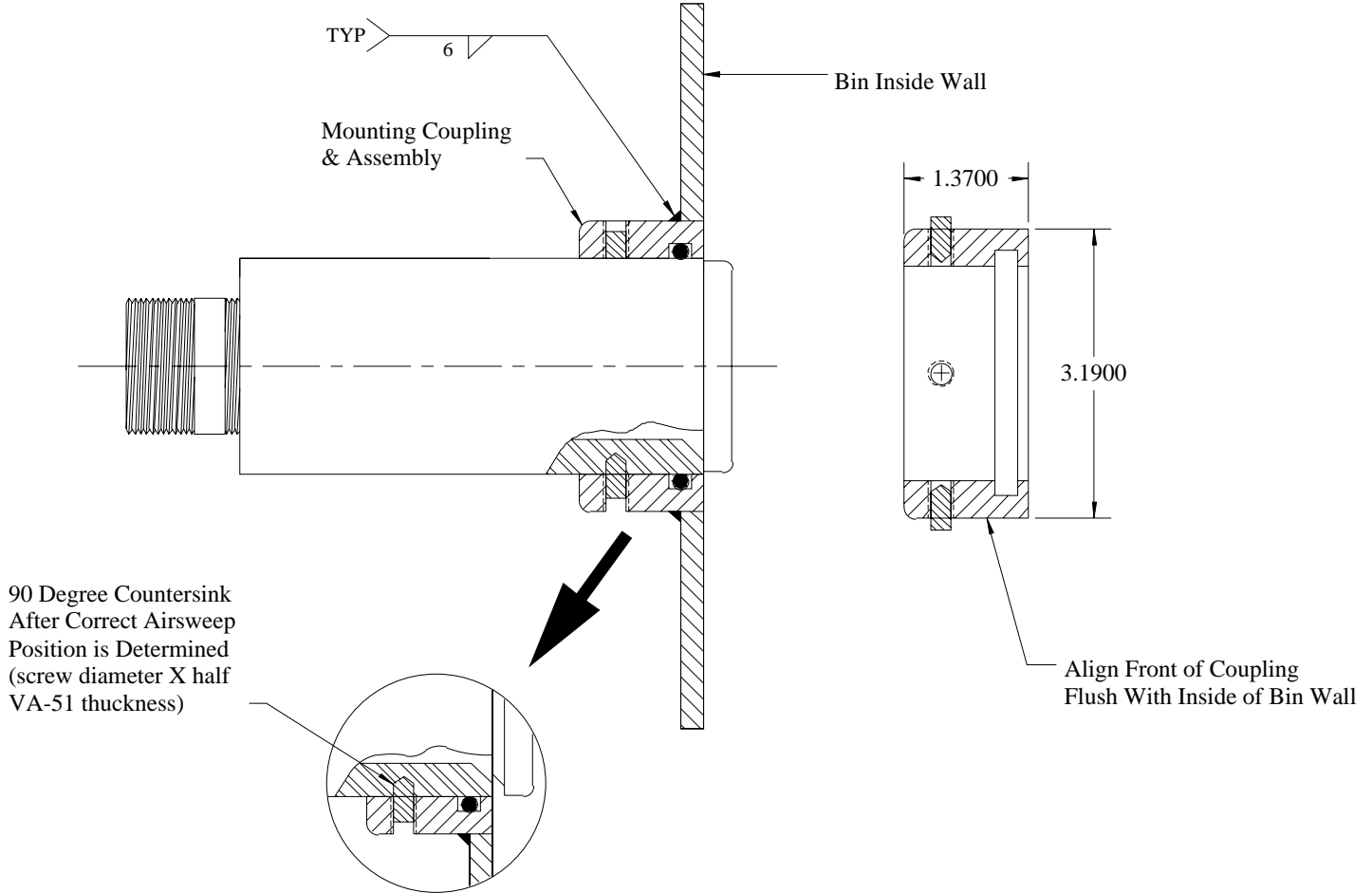
Air receiver connection detail



Header/Airsweep connection detail



MC-51 Mounting Coupling Installation

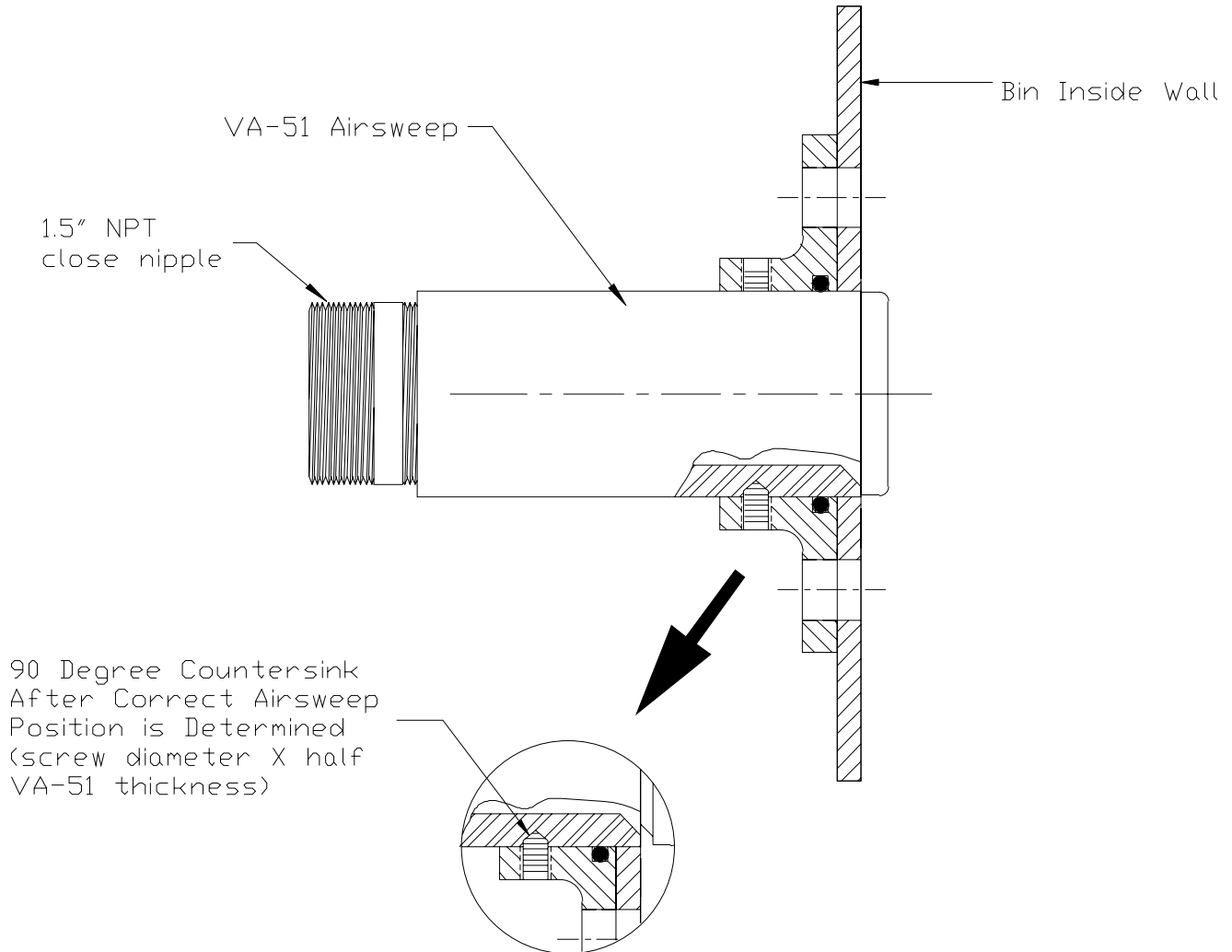


Mounting Coupling Installation

1. Cut hole in hopper wall, diameter to fit (1/8" greater than diameter of coupling (3 1/4") is recommended to allow coupling to pass through curved wall).
2. Remove O-Ring, and apply splatter-guard in O-Ring groove. Align coupling flush with inside of vessel wall and weld continuous bead to exterior of wall. Replace O-Ring after flange has cooled. O-Ring groove should be cleaned and free of debris or residue before replacing O-Ring.
3. Slide Airsweep into position, so that front of body of Airsweep is aligned with front of coupling. This will properly position piston head within the bin.
4. After position of Airsweep is determined to be correct, small countersink holes should be drilled in Airsweep body, to allow cone point set screw to engage fully with body.

Note: On sharply curved bin walls, body of Airsweep will extend slightly into the bin at top & bottom (12:00 & 6:00 positions), and should be flush at sides (3:00 & 9:00 positions).

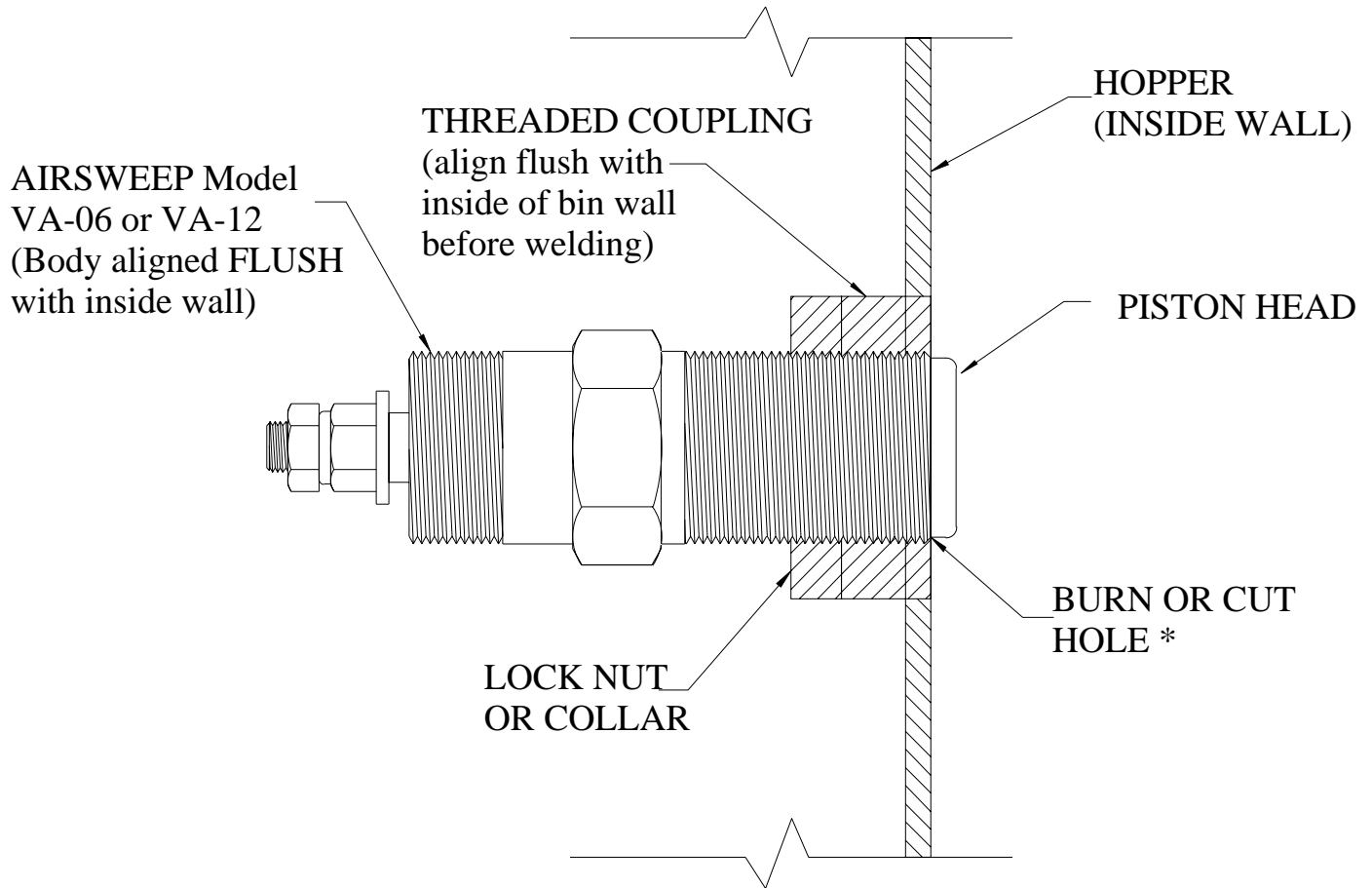
MF-51 Mounting Flange Installation



Mounting Flange Installation

1. Position flange on wall and mark bolt circle layout (if bolting) and hole for Airsweep.
2. Cut hole in hopper wall for Airsweep, sufficient diameter (min. $\varnothing 2 \frac{1}{8}$ ") to allow Airsweep to pass through wall.
3. Drill bolt holes, if bolting.
4. If welding, remove O-Ring from flange, and apply splatter-guard in O-Ring groove.
5. Bolt or weld flange to wall. If bolting, use rubber gasket in between wall and flange. Rubber gasket should not be used if welding. If welding, replace O-Ring after flange has cooled. O-Ring groove should be free of debris or residue before replacing O-Ring.
6. Slide Airsweep into position, so that front of body of Airsweep is aligned flush with inside bin wall. This will properly position piston head within the bin.
7. After position of Airsweep is determined to be correct, small countersink holes should be drilled in Airsweep body, to allow cone point set screw to engage fully with body.

MC-06/MC-12 Mounting Coupling Installation



Mounting Coupling Installation

1. Cut hole in hopper wall, diameter to fit (1/8" greater than diameter of coupling is recommended to allow coupling to pass through curved wall).

*** Hole sizes: VA-06: 1-9/16" VA-12: 3-1/16"**

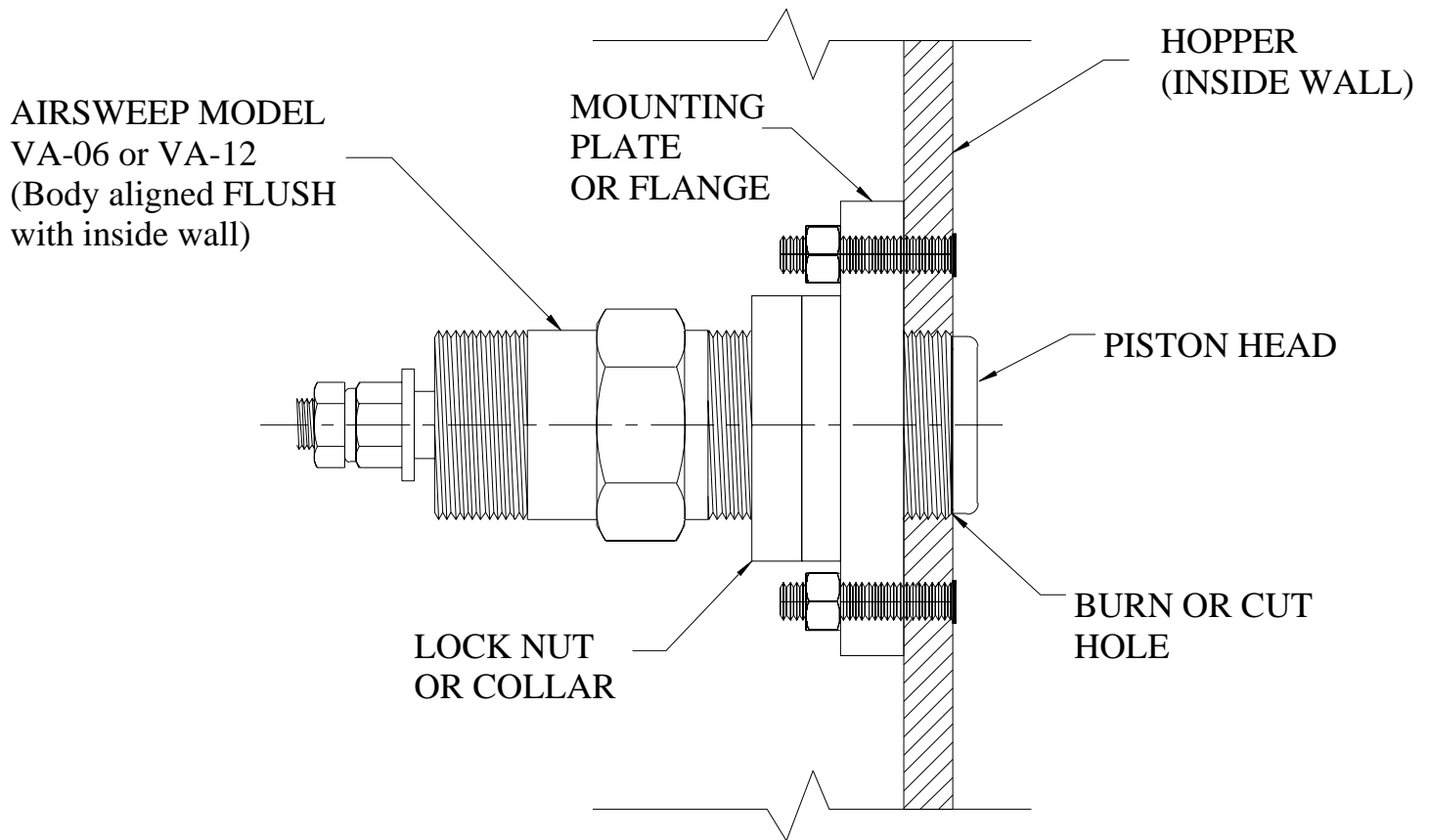
2. Align coupling flush with inside of vessel wall and weld continuous bead to exterior of wall.

3. Apply anti-seize compound to front threaded section of Airsweep. Thread Airsweep into position, so that front of body of Airsweep is aligned with front of coupling. This will properly position piston head within the bin.

4. After position of Airsweep is determined to be correct, tighten lock nut or collar against coupling to keep Airsweep in position.

Note: On sharply curved bin walls, body of Airsweep will extend slightly into the bin at top & bottom (12:00 & 6:00 positions), and should be flush at sides (3:00 & 9:00 positions).

MP-06/MF-12 Mounting Flange Installation



Mounting flange/plate Installation

- 1.** Position flange or plate on wall surface. Mark hole for Airsweep. If bolting, mark bolt circle layout.
- 2.** Drill or cut hole for Airsweep (and bolt holes, if needed). Hole size for Airsweep should be sufficient diameter to allow Airsweep to pass through wall.
- 3.** Fasten plate or flange to wall by bolting, or weld continuous bead around flange or plate to exterior of wall.
- 4.** Apply anti-seize compound to front threaded section of Airsweep. Thread Airsweep into position, so that front of body of Airsweep is aligned with front of coupling. This will properly position piston head within the bin.
- 4.** After position of Airsweep is determined to be correct, tighten lock nut or collar against coupling to keep Airsweep in position.

INSTALLATION AND MAINTENANCE
MODEL DV1251
1 ½" PULSE VALVE
WITH INTEGRAL SOLENOID PILOT



DESCRIPTION

Myrlen DV1251-series valve is a 2-way quick opening/closing, high flow, diaphragm-type integral solenoid piloted valve. Also available as a remote pilot-operated valve (model RDV1251).

SOLENOID ENCLOSURES

DV1251-C or D: Watertight, NEMA Types 1, 2, 3, 3S, 4 & 4X enclosure specifications.

DV1251-XP: Explosion-proof & Watertight, NEMA Types 3, 3S, 4 & 4X; Types 6 & 6P; Type 7 (Explosion-proof, Class 1, Division 1, Groups A, B, C & D) and Type 9 (Dust ignition-proof, Class II, Division 1, Groups E, F & G) enclosure specifications.

ELECTRICAL (110/120 or 220/240 AC volts, 50/60 Hz)*

Watts: 10.1

VA Holding: 25

VA Inrush: 50

*(other AC & DC voltages available).

CONSTRUCTION (Parts in contact with fluids)

Body: Aluminum (less than 0.4% copper)

Seals: Buna "N"

Discs: Buna "N"

Diaphragm: Hytrel*

*(Viton seals and diaphragm available for high heat applications)

NOMINAL TEMPERATURE RANGES*

Ambient & Fluids: 0°F to 150°F (-19°C to 66°C)

*For high temperature, specify Viton diaphragm & seals.

Viton range: 0°F to 350°F (-18°C to 177°C)

Fluid: Air or Nitrogen (inert gas)

Working Pressures: (minimum) 5 psi.; (maximum) 125 psi.

Cv flow factor: 53

Pipe size: 1 ½" NPT inlet & outlet and 3/8" NPT exhaust port

OPERATION

Normally closed: Valve is closed when solenoid is de-energized. Valve opens when solenoid is energized.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

For DV1251-XP ONLY:

Caution: to prevent fire or explosion, do not install the DV1251-XP where ignition temperature of hazardous atmosphere is less than 165°C.

POSITIONING

This valve is designed to perform properly when mounted in any position.

NOTE: for optimum life and performance, the solenoid should be mounted vertical and upright so as to reduce the possibility of foreign matter accumulating in the core tube area.

PIPING

Connect piping to valve according to markings on valve body (Inlet port is marked with "IN"). **3/8" port on upper chamber of valve is exhaust ONLY.** Do not connect anything to exhaust port except a high-flow muffler or strainer. Restriction to flow through this port will cause valve to malfunction, operate sluggishly or not operate at all.

Thread seal tape is recommended, rather than pipe compound. If compound is used, apply sparingly to male threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening pipe, do not use valve as a lever. Wrenches applied to valve body or piping should be located as close as possible to connection point.

CAUTION: To avoid damage to the valve body DO NOT OVERTIGHTEN PIPE

CONNECTIONS. If tape thread seal, spray or similar lubricant is used, use extra care due to reduced friction

WIRING

Wiring must comply with Local and National Electrical Codes. Conduit-style solenoid housings are provided with a hole to accommodate 1/2 inch NPT conduit. The solenoid enclosure may be rotated to facilitate wiring.

SOLENOID TEMPERATURE

Standard DV1251 valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched by the hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

FOR DV1251-XP ONLY: the integral solenoid in the DV1251-XP has an internal non-reset able thermal fuse to limit solenoid temperature in the event that extraordinary conditions occur which could cause excessive temperatures. These conditions could include high input voltage, a jammed core, excessive ambient temperature, or a shorted solenoid, etc.

MAINTENANCE

WARNING: Turn off electrical power supply and de-pressurize valve and header before making repairs. **NOTE:** It is generally not necessary to remove the valve from the pipeline for repairs.

CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary depending on medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate the valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on medium and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts, seats and bleed holes. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Faulty Control Circuits:** Check the electrical system by energizing the solenoid. A metallic click signifies the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires, terminals or splice connections.
2. **Burned-Out Coil:** Check for open-circuited coil; if faulty, replace coil.
3. **Low Voltage:** Check voltage across coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within 5 - 125 psi.
5. **Excessive Leakage or Failure to Open or Close:** Check for restrictions to or blockage of exhaust port. Disassemble valve and clean all parts. Check for clogged bleed holes or torn diaphragm assemblies. Replace parts that are worn or damaged with a complete spare parts kit for best results

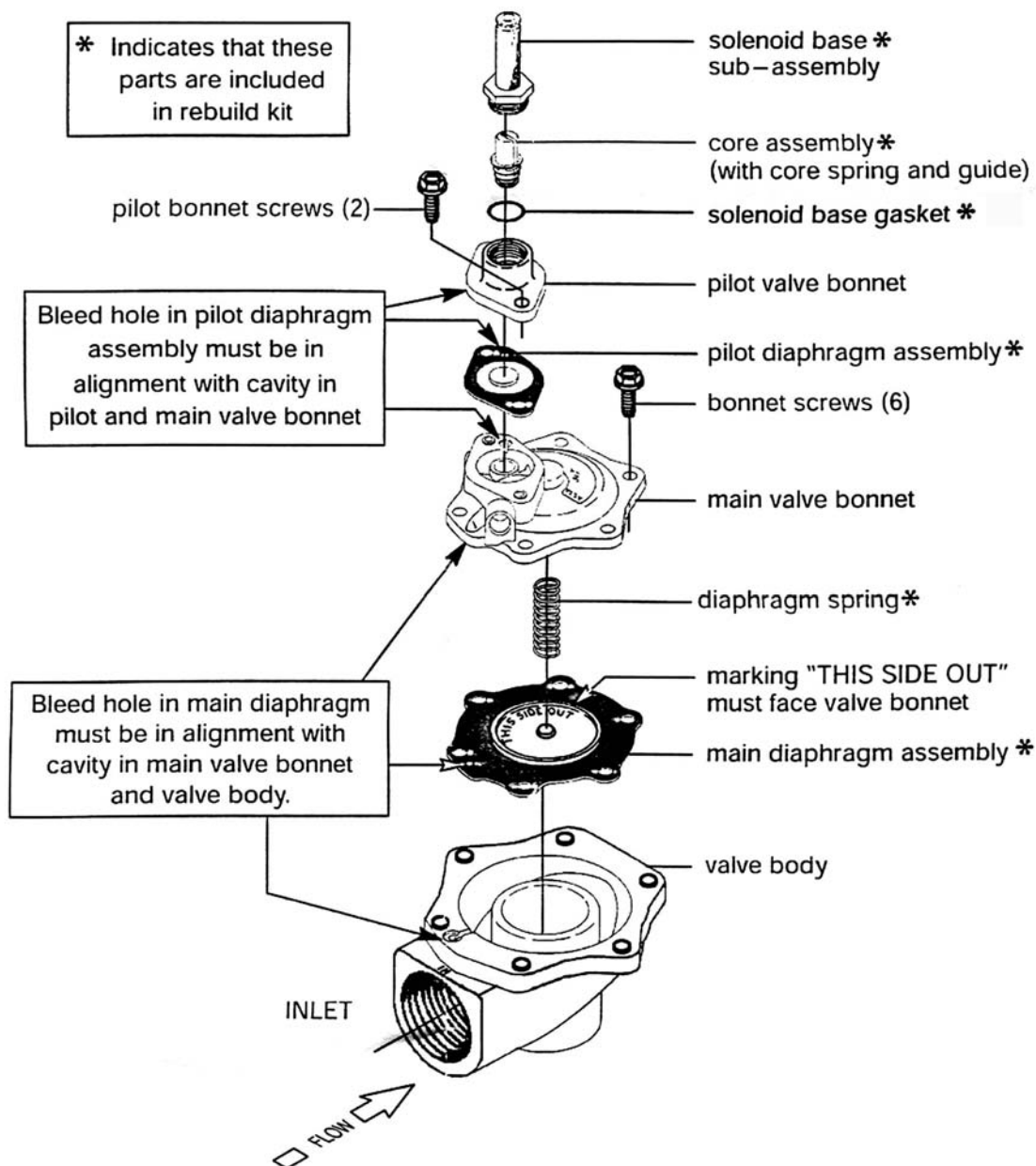
VALVE DISASSEMBLY (Refer to diagram on next page)

De-pressurize valve and turn off electrical power supply. If rigid conduit is used it may be necessary to disconnect it. Proceed in the following manner:

1. Disassemble valve in an orderly fashion, paying careful attention to exploded view provided for identification of parts.
2. Remove retaining clip & plate and slip the entire coil enclosure off the solenoid base sub-assembly.
3. Unscrew solenoid base sub-assembly from pilot bonnet. Remove core assembly, core spring, core guide and solenoid base gasket.
4. Unscrew pilot bonnet screws and remove pilot bonnet and pilot diaphragm assembly.
5. Remove main bonnet screws, main valve bonnet and main diaphragm assembly.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete spare parts kit for best results.

VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
2. Lubricate solenoid base gasket with DOW CORNING 111 Compound lubricant or an equivalent high-grade silicone grease.
3. Replace main diaphragm assembly with marking "THIS SIDE OUT" facing main valve bonnet. Be sure that bleed hole in diaphragm assembly is in alignment with cavity in valve body and bonnet. The external contours of the diaphragm assembly, body and bonnet must all be in alignment.
4. Replace main bonnet and bonnet screws. Torque main bonnet screws in a crisscross manner to 160 ± 10 inch-pounds ($18,1 \pm 1,1$ newton meters).
5. Position pilot diaphragm assembly in valve bonnet. Be sure bleed hole in pilot diaphragm assembly is in alignment with cavity in bonnet.
6. Replace pilot bonnet and pilot bonnet screws. Torque pilot bonnet screws evenly to 95 ± 10 inch-pounds ($10,7 \pm 1,1$ newton meters).
7. Position core assembly with core spring and core guide into solenoid base sub-assembly. Engage this assembly into the pilot bonnet. Torque solenoid base sub-assembly to 175 ± 25 inch-pounds ($19,8 \pm 2,8$ newton meters).
8. Replace coil and retaining clip.
9. After maintenance, operate valve a few times to be sure of proper opening and closing.



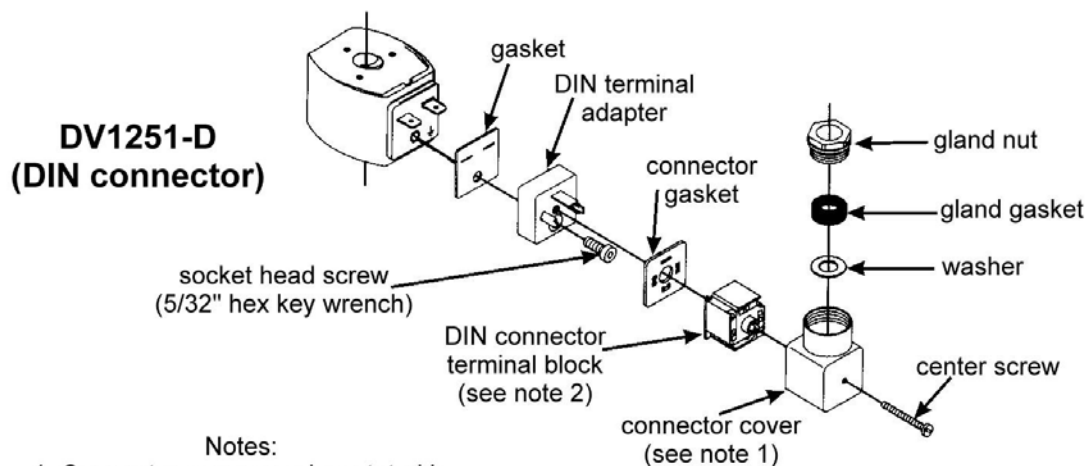
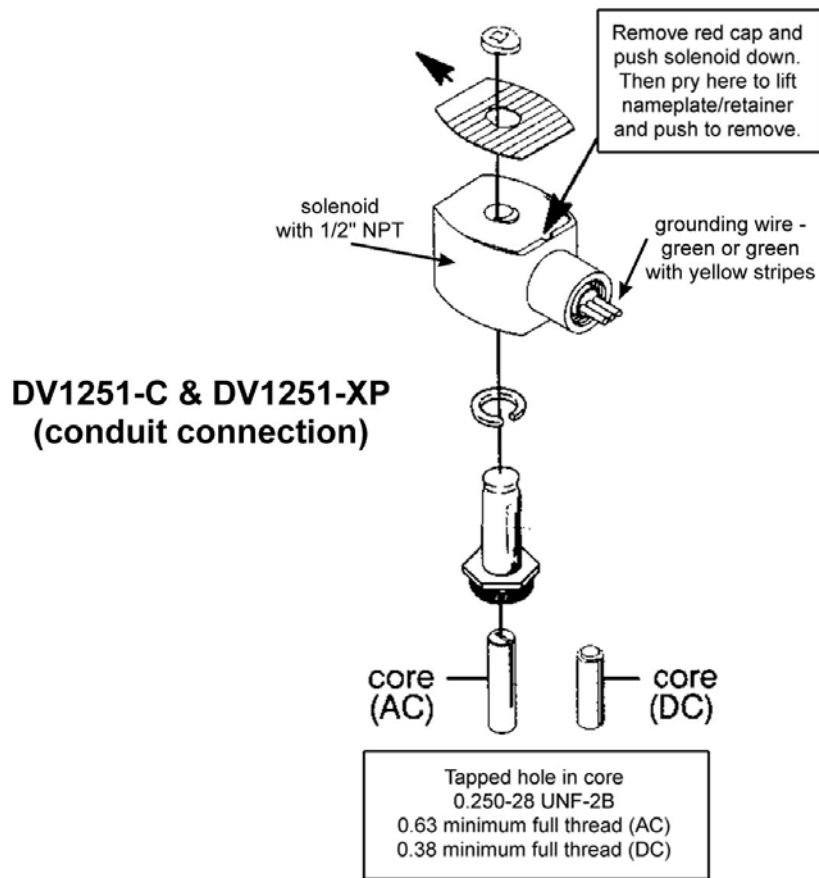
Parts marked with (*) are supplied in spare parts kit # RK-DV1251.

Torque Chart

Part Name	Torque Value	
	Inch-Pounds	Newton-Meters
Solenoid Base Sub-Assembly	175 ± 2.5	19,8 ± 2,8
Bonnet Screws (pilot)	95 ± 10	10,7 ± 1,1
Bonnet Screws (main)	160 ± 10	18,1 ± 1,1

DV1251 – Coil Connection Options

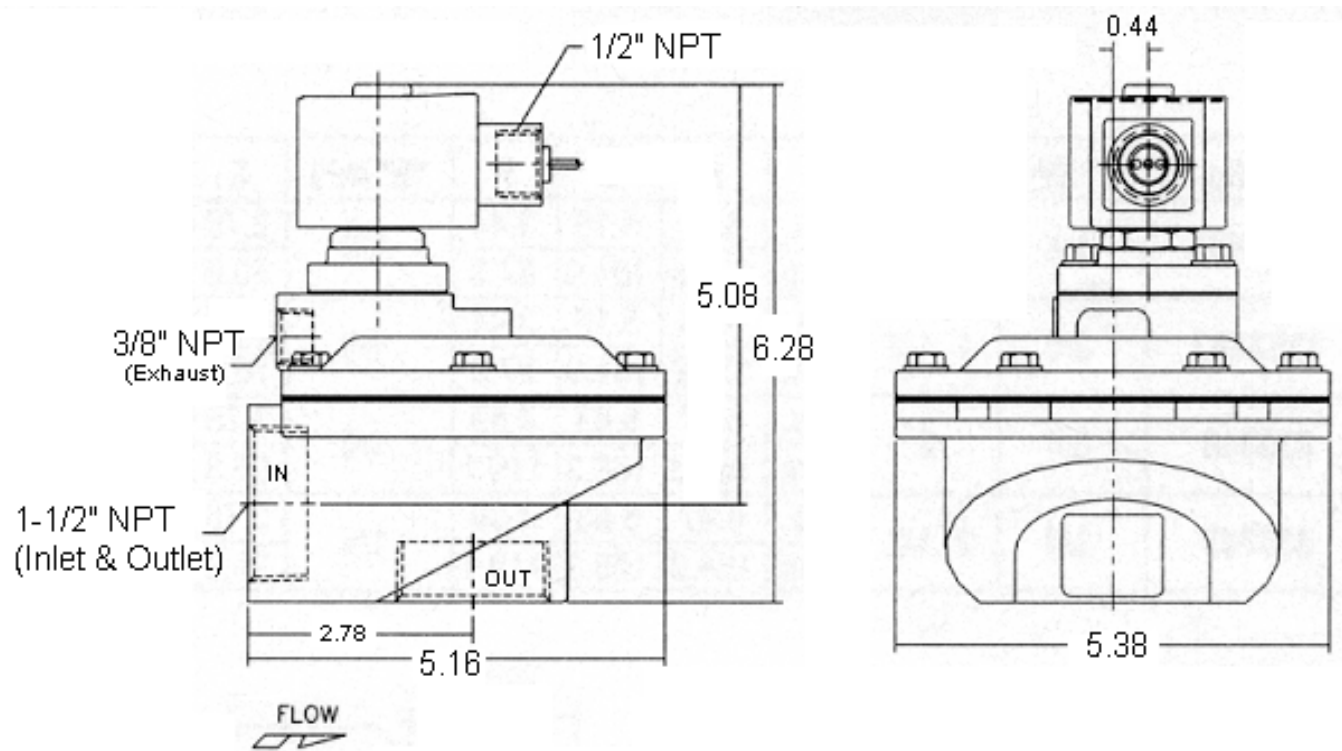
(note: DIN connector not available on XP valves)



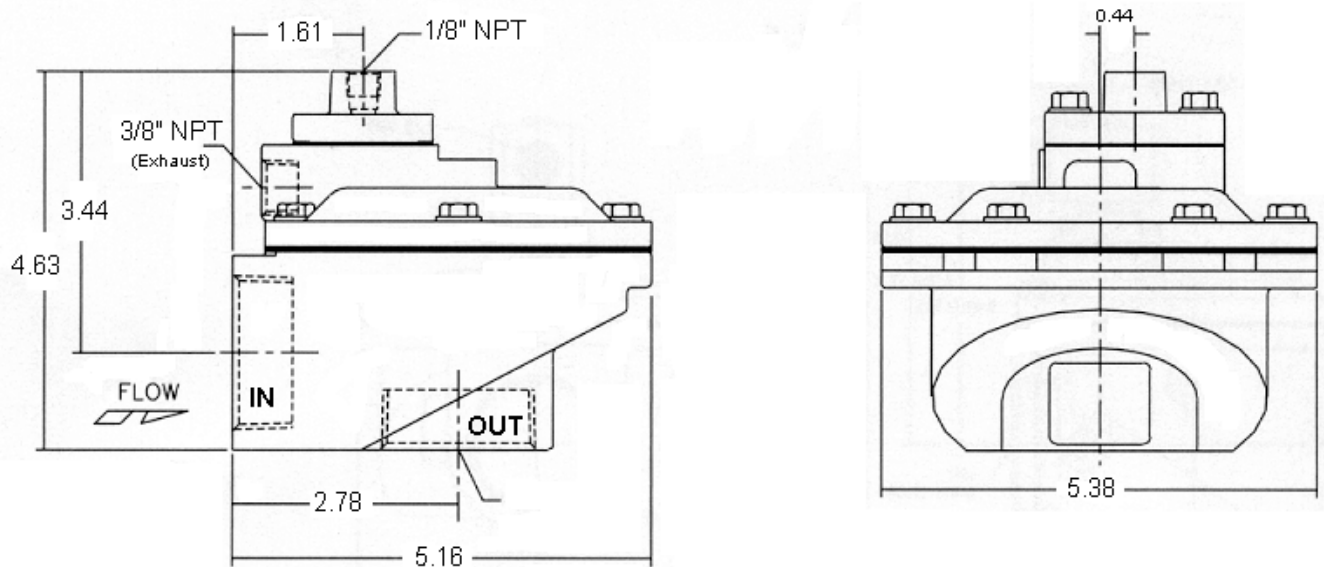
Notes:

1. Connector cover may be rotated in 90-degree increments from position shown for alternate position of cable entry.
2. Refer to markings on DIN connector for proper electrical connections.

DV1251 1-1/2" Diaphragm Valve with Integral Solenoid



RDV1251 1 1/2" Remote Pilot-Operated Diaphragm Valve



INSTALLATION AND MAINTENANCE MODEL DV06

**3/4" PULSE VALVE
WITH INTEGRAL SOLENOID PILOT**



DESCRIPTION

Myrlen DV06-series valve is a 2-way quick opening/closing, high flow, piston diaphragm-type integral solenoid piloted valve. Also available as a remote pilot-operated valve (model RDV06).

SOLENOID ENCLOSURES

DV06-C: Watertight, NEMA Types 1, 2, 3, 3S, 4 & 4X enclosure specifications.

DV06-XP: Explosion-proof & Watertight, NEMA Types 3, 3S, 4 & 4X;
Types 6 & 6P; Type 7 (Explosion-proof, Class 1, Division 1, Groups A, B, C & D) and
Type 9 (Dust ignition-proof, Class II, Division 1, Groups E, F & G) enclosure specifications.

ELECTRICAL (110/120 or 220/240 AC volts, 50/60 Hz)*

Watts: 10.1

VA Holding: 25

VA Inrush: 50

*(other AC & DC voltages available).

CONSTRUCTION (Parts in contact with fluids)

Body: Aluminum (less than 0.4% copper)

Seals: Buna "N"

Discs: Buna "N"

Diaphragm: Hytrel*

*(Viton seals and diaphragm available for high heat applications)

NOMINAL TEMPERATURE RANGES*

Ambient & Fluids: 0°F to 150°F (-19°C to 66°C)

*For high temperature, specify Viton diaphragm & seals.

Viton range: 0°F to 350°F (-18°C to 177°C)

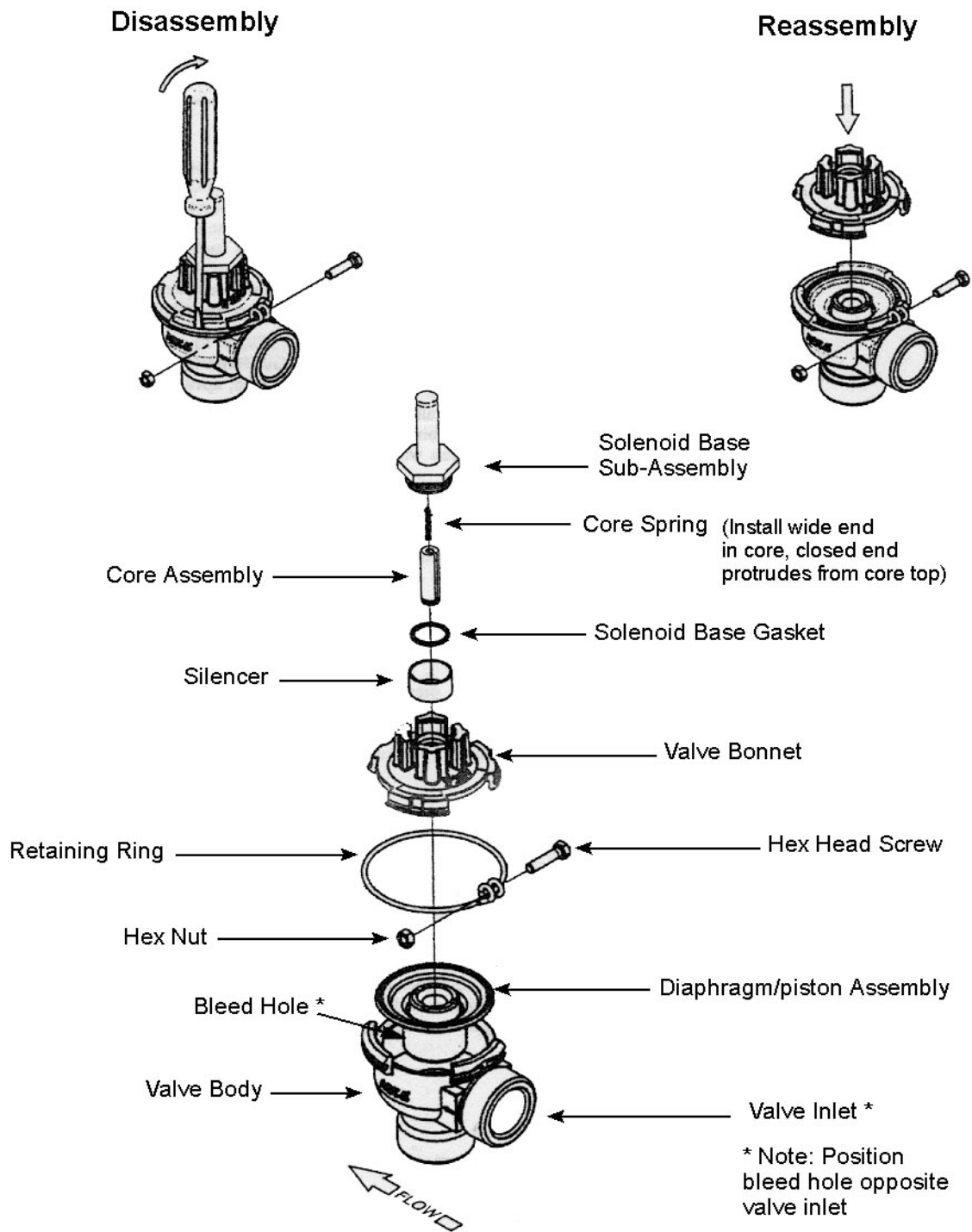
Fluid: Air or Nitrogen (inert gas)

Working Pressures: (minimum) 5 psi.; (maximum) 125 psi.

Cv flow factor: 15

Pipe size: 3/4" NPT inlet & outlet.

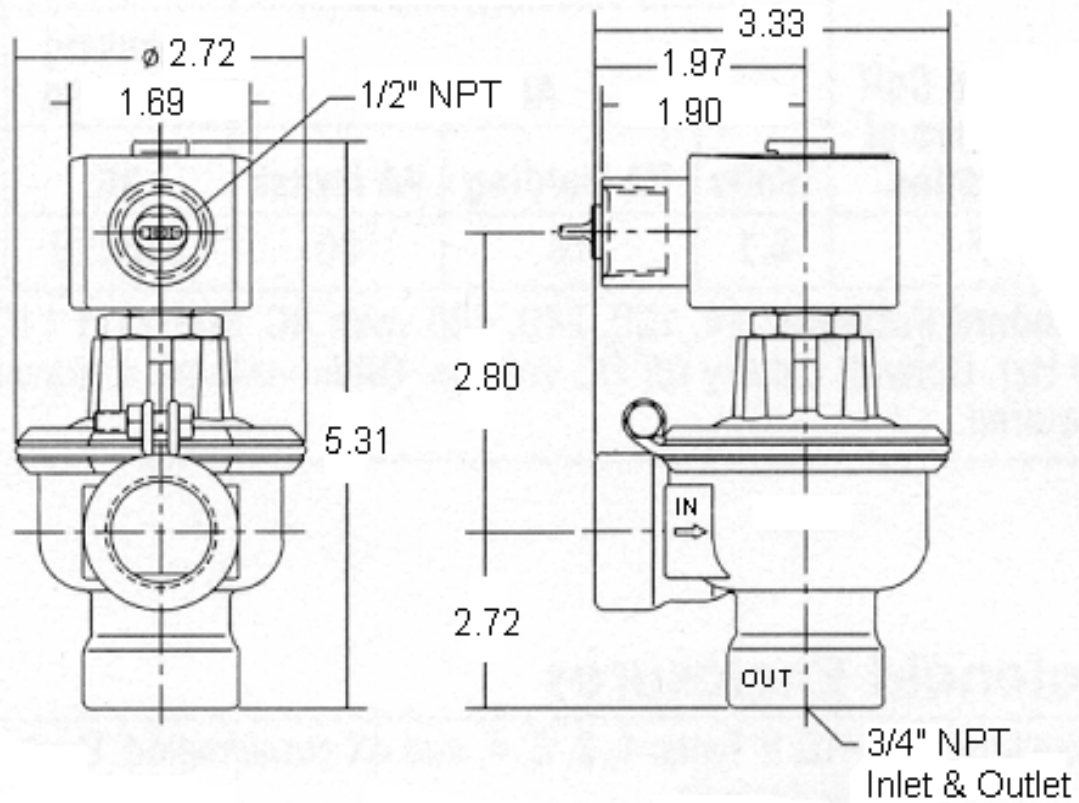
DV06 Exploded View (less coil)



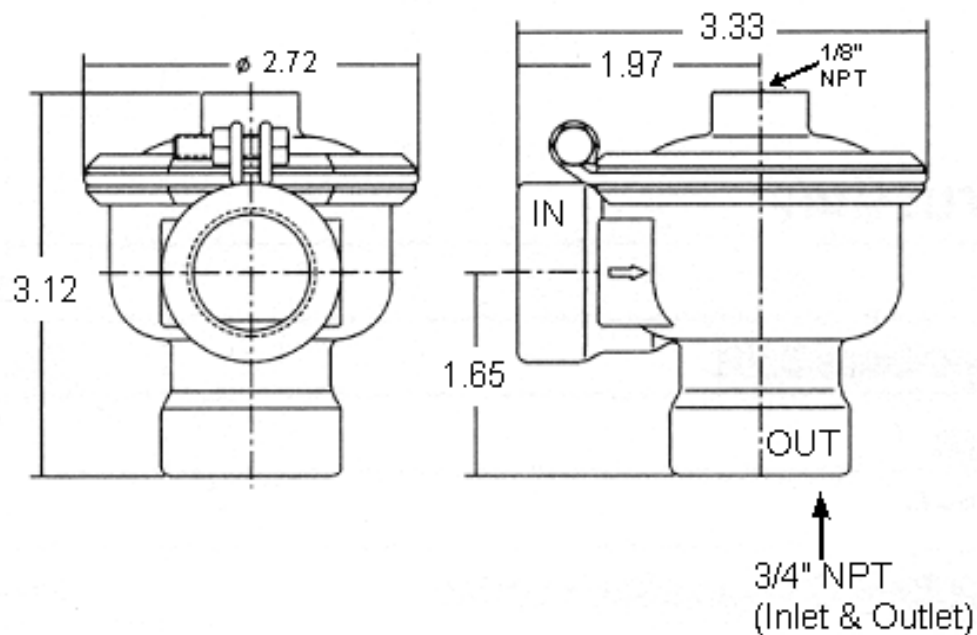
Torque solenoid base sub-assembly to 175 (\pm 25) in-lbs

Parts kit # RK-DV06 includes all above parts EXCEPT valve body, retaining ring, hex head screw and hex nut.

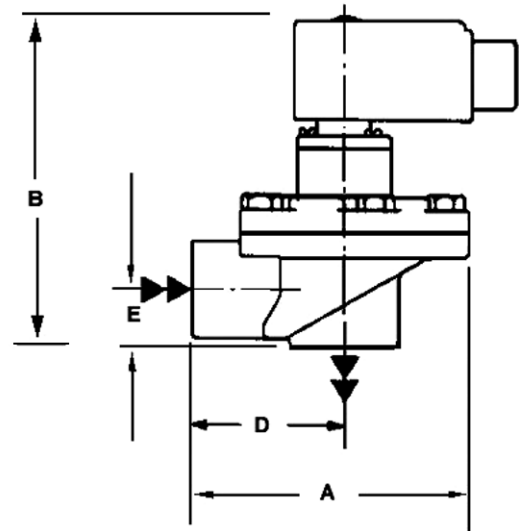
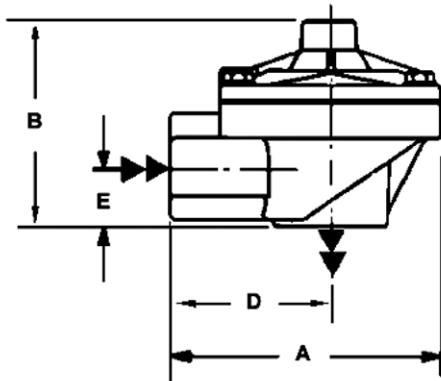
DVO6 3/4" Diaphragm Valve with Integral Solenoid



RDV06 3/4" Remote Pilot-Operated Diaphragm Valve



Model MCA/RCA Diaphragm Valves (3/4 & 1 1/2")



Dimensions (inches)

Model	Orifice	A	B	C (Width)	D	E
RCA-20T	3/4	3.97	2.97	3.44	2.19	.78
RCA-45T	1 1/2	5.41	4.72	4.96	2.93	1.28
MCA-20T	3/4	3.95	4.91	3.44	2.19	.78
MCA-45T	1 1/2	5.41	6.71	4.96	2.93	1.28

Pilot Connections: 1/8" NPT

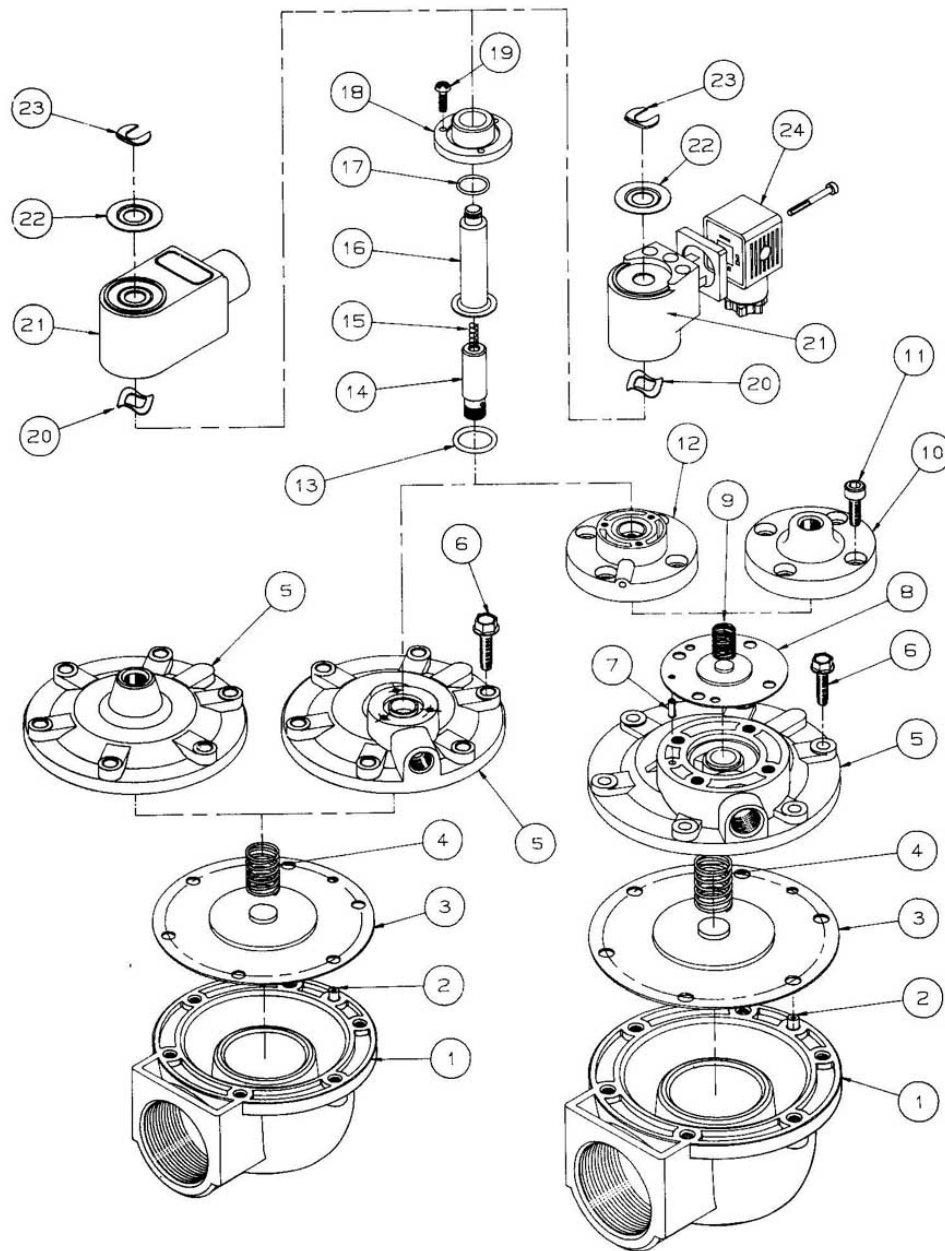
Exhaust Connections:

MCA/RCA 20 – 1/8" NPT

MCA/RCA 45 – 3/8" NPT

SPARE PARTS KITS

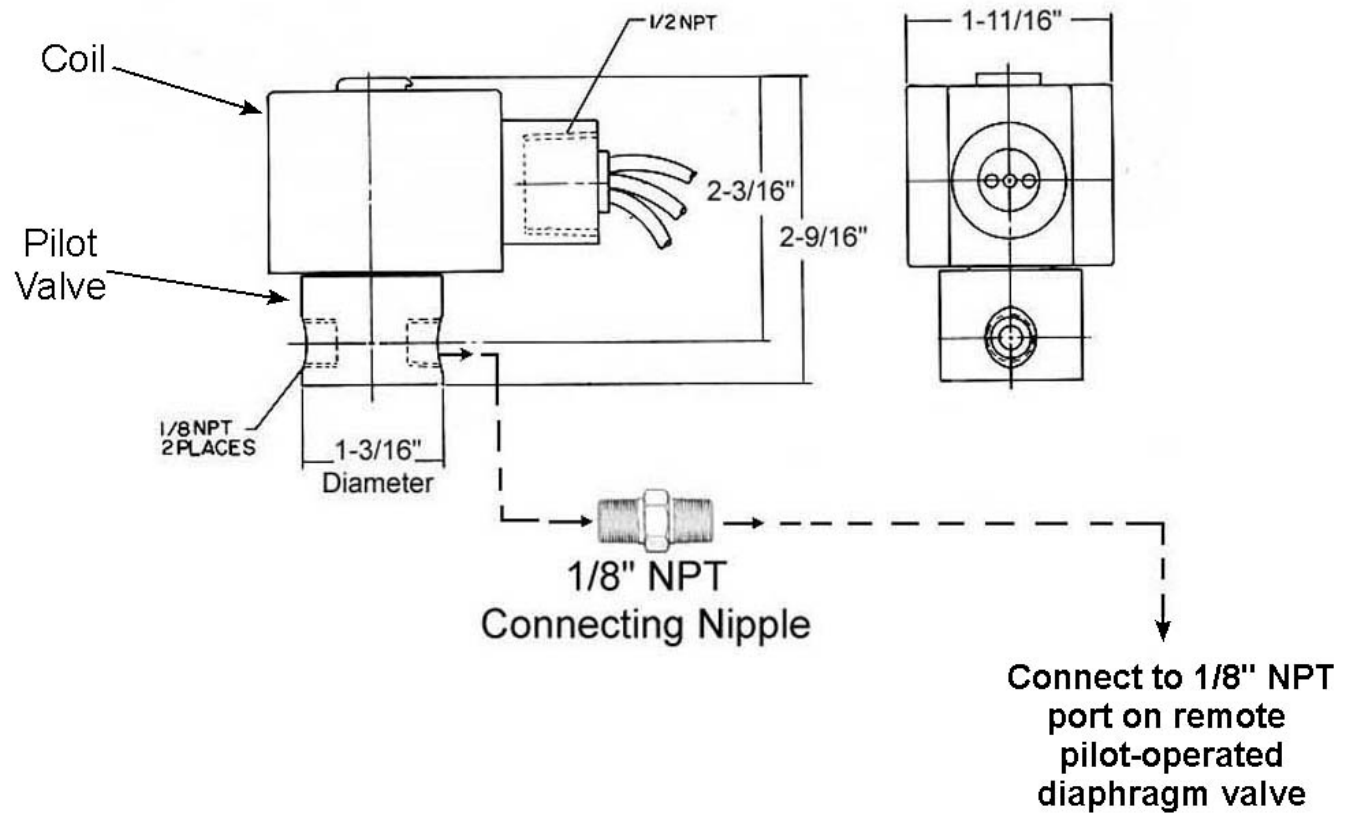
Model	<u>Solenoid Kit</u>		<u>Diaphragm Kit</u>	
	Buna N	Viton	Buna N	Viton
MCA/RCA-20T	M1131B	M1167B	K2000	M2082
MCA/RCA-45T	M1131B	M1167B	K4502	M2163



PARTS LIST, MCA/RCA-SERIES DIAPHRAGM VALVE

ITEM	Description	Quantity	ITEM	Description	Quantity
1	Body	1	13	O-Ring	1
2	Main Bleed Pin	1	14	Plunger	1
3	Main Diaphragm Assembly	1	15	Spring, Plunger	1
4	Spring, Main Diaphragm	1	16	Ferrule Assembly	1
5	Main Cover	1	17	O-Ring	1
6	Hexagonal Screw	4 or 6	18	Ferrule Retainer	1
7	Secondary Bleed Pin	1	19	Screw	3
8	Secondary Diaphragm	1	20	Wave Washer	1
9	Spring, Sec. Diaphragm	1	21	Coil (QR/QD)	1
10	Secondary Cover (RCA)	1	22	Nameplate	1
11	Socket Screw	4	23	Clip	1

Pilot valve for Remote Pilot-Operated Diaphragm Valves



TROUBLE SHOOTING

PROBLEM

POSSIBLE CAUSE

1. Diaphragm Valve fails to operate (open)

- No pressure in header
- Low or no power to coil
- Coil inoperative
- Pilot valve plunger jammed shut
- Pilot orifice blocked
- Secondary bleed-hold blocked
- Main diaphragm perforated
- Secondary diaphragm perforated
- Pilot valve connecting line too long
- Silencer, if fitted, may be blocked

2. Diaphragm Valve fails to shut

- Pilot valve plunger jammed open
- Foreign matter under pilot valve
- Secondary diaphragm spring broken
- Foreign matter under secondary diaphragm
- Main diaphragm spring broken
- Foreign matter under main diaphragm
- Main diaphragm seating disc damaged
- Main bleed hole blocked
- Secondary bleed hole blocked
- Leak in line connecting pilot valve

3. Unable to build header pressure

- Excessive leakage from main diaphragm seat
- Broken main valve spring
- Secondary diaphragm not seating
- Foreign matter under main or secondary diaphragm seat or under pilot valve seat
- Air supply line too small
- Compressor too small

4. Sluggish operation of diaphragm valve

- Partial blockage of one of the bleed-holes
- Silencer, if fitted, may be blocked

SPECIAL NOTE

To prevent premature failure of a diaphragm valve, special attention must be paid to the quality of the compressed air/gas being handled.

An adequate moisture and oil removal system must be incorporated that takes into account:

- relative humidities likely to be experienced
- ambient temperatures
- system operating temperatures
- pressure drops (and associated temperature drops) through the valve and also through the blow tube holes (dew point problem)

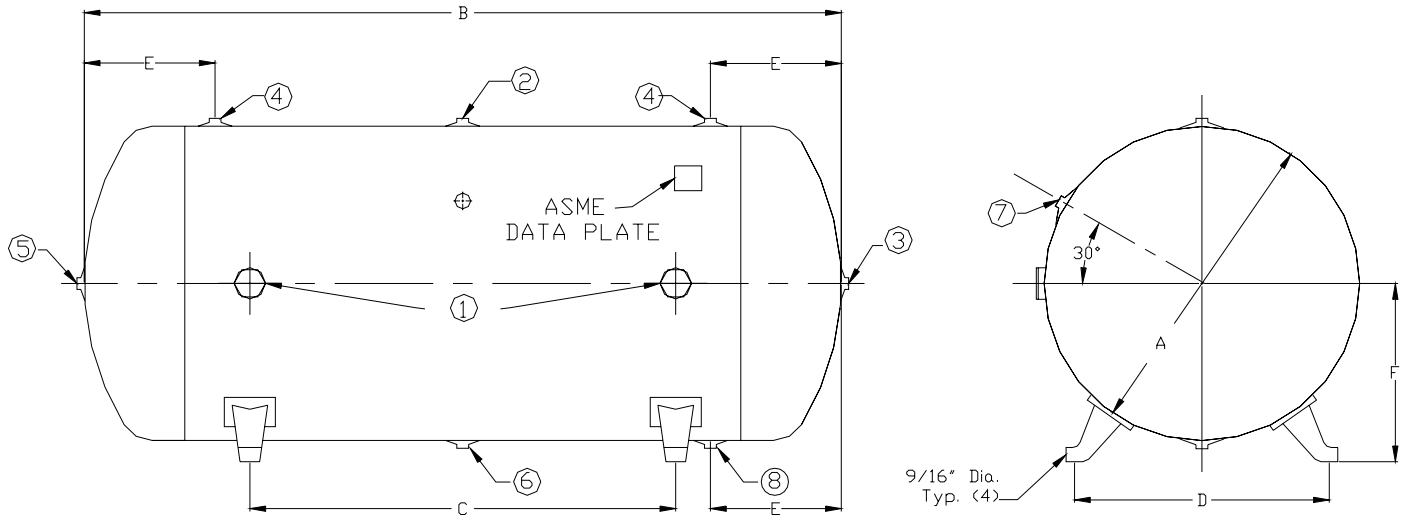
Also, small traces of chlorine and other aggressive gases, often present in filter systems, can be absorbed in wet areas resulting in corrosion and premature failure.

Apart from valve failures, systems may not perform to expectation for a number of reasons including the following:

- inaccurate mounting/positioning of the Airsweep(s) relative to the vessel wall
- inadequately sized header and/or air supply
- incorrect pulse time
- incorrect intervals between pulses
- improper adjustment or wear of Airsweep(s) piston head

ASME HORIZONTAL AIR RECEIVERS

30, 60, 80 Gallon



		DIMENSIONS						Port size (NPT)							
Tank Size	Gal	A	B	C	D	E	F	1	2	3	4	5	6	7	8
14 X 48	30	14	48	33	14	5 9/16"	9 1/2"	1 1/2"	1/2"	3/4"	1/2"	3/4"	-	-	1/4"
20 X 48	60	20	48	26	18 1/2"	7 7/8"	12 3/4"	2	1 1/2"	1 1/2"	1 1/2"	1	3/4"	1/4"	-
20 X 63	80	20	63	36	18 1/2"	9	12 3/4"	2	1 1/2"	1 1/4"	1	3/4"	3/4"	1/4"	-

All dimensions in inches

All receivers are built in accordance with the ASME section VIII Division I code latest addition. All vessels are "U" stamped and registered with National Board.

Note: California requirements special – please call.

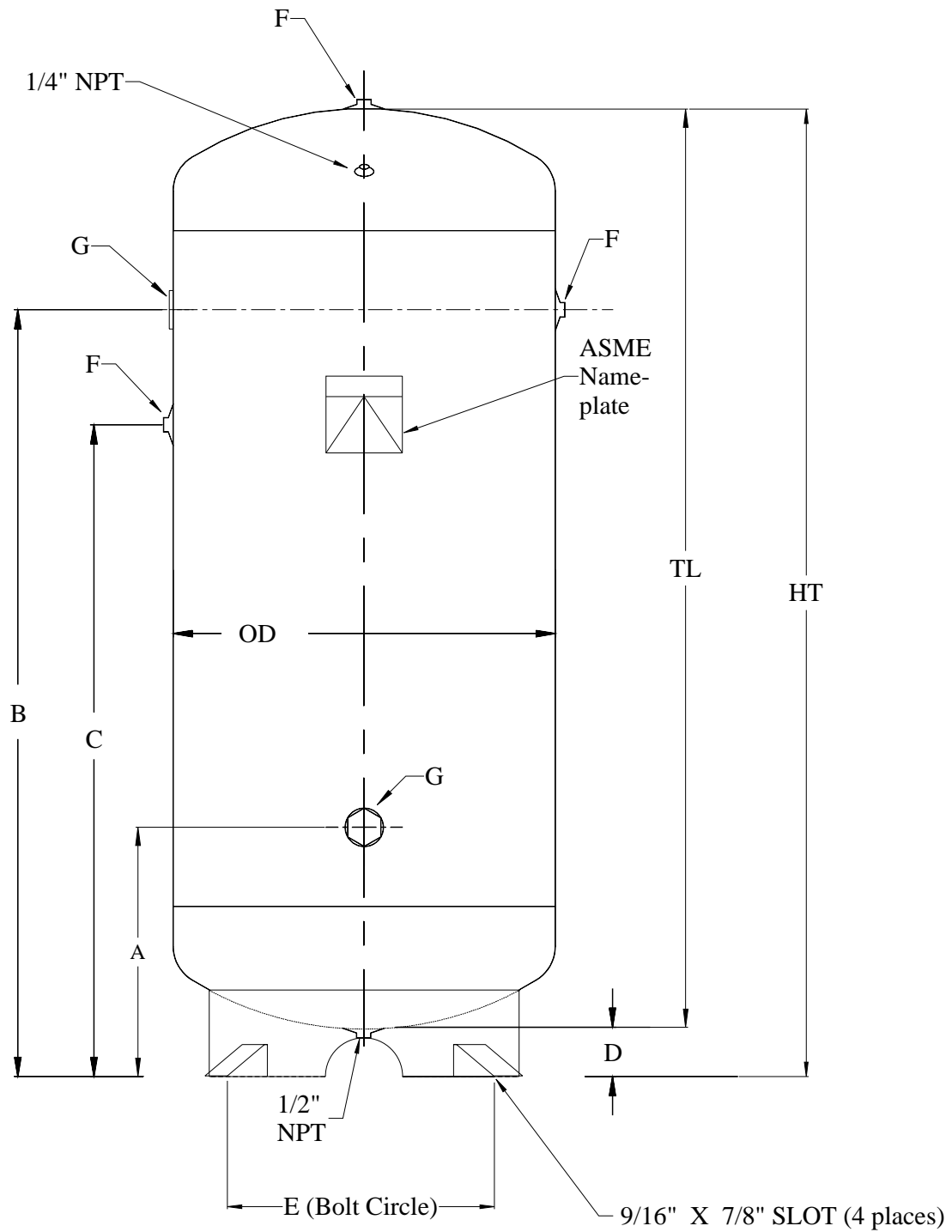
Design pressure to 200 PSIG, test pressure 300 PSIG.

Design temperature: -20° to 650° F.

Type 1, 2:1 elliptical heads. All seams submerged arc welded.

Painted with one coat of standard gray shop primer.

ASME VERTICAL AIR RECEIVERS: 30, 60, 80 gallon

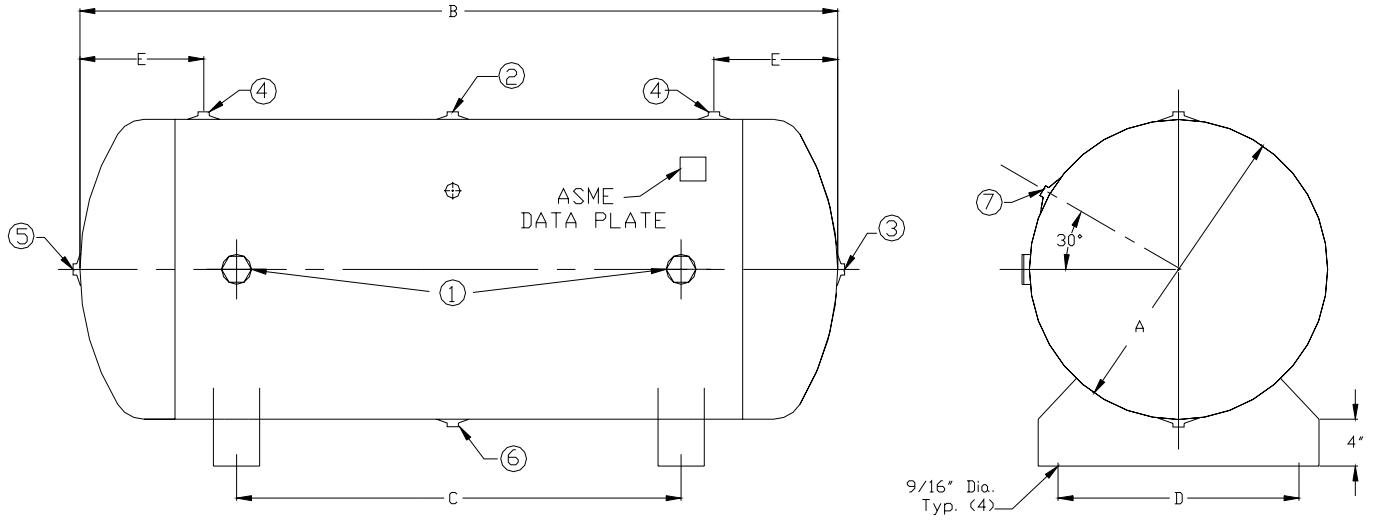


Gal	OD	Length (TL)	Height (HT)	A	B	C	D	E	F (NPT)	G (NPT)
30	16	38	40.81	12.56	30.06	25.06	2.81	15	.75	1.5
60	20	48	50.75	13.75	39.75	33.75	2.75	17	.75	2
80	24	46	49.19	13.06	39.31	34.31	3.19	21	1.25	2

All dimensions in inches

ASME STANDARD HORIZONTAL AIR RECEIVERS

120, 200, 240 Gal.

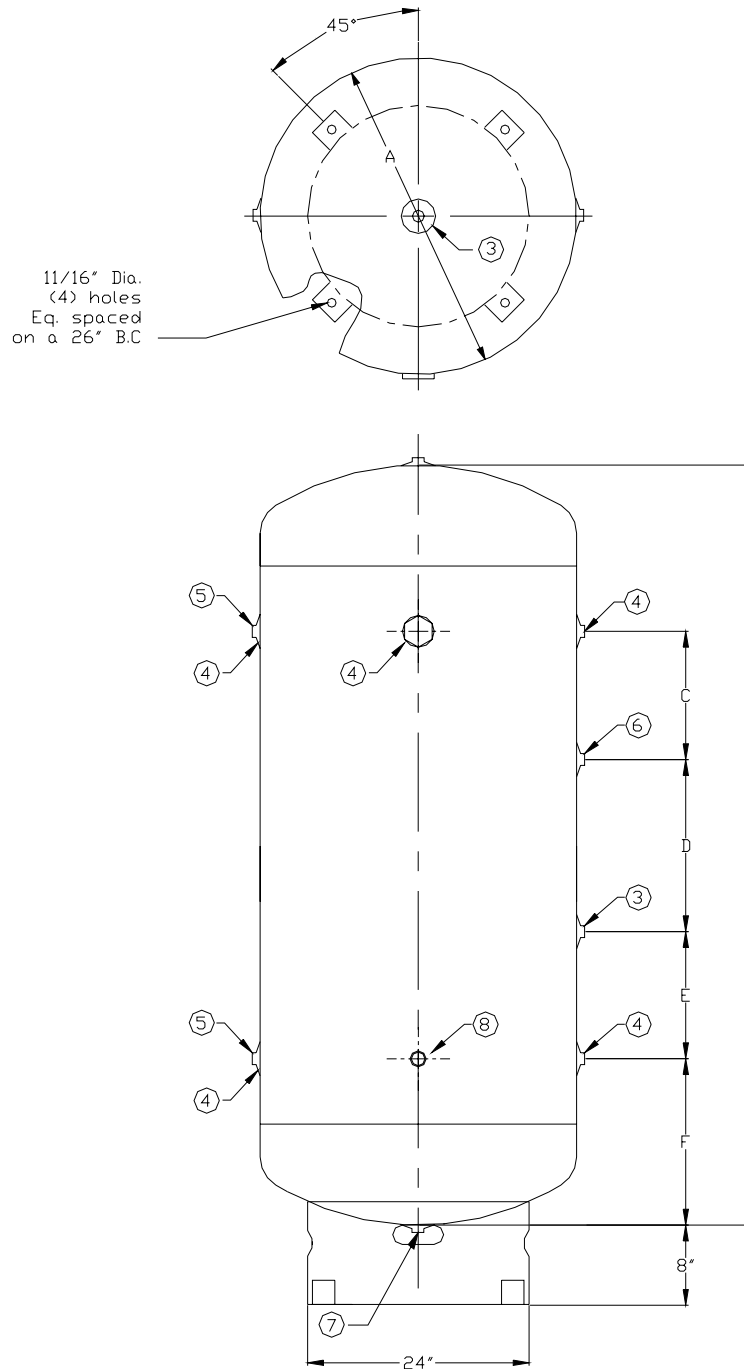


		DIMENSIONS					Port size (NPT)						
Tank Size	Gal	A	B	C	D	E	1	2	3	4	5	6	7
24 x 69	120	24	69	42	22	10	2	1 1/2"	1 1/2"	1 1/2"	1	3/4"	1/4"
30 x 72	200	30	72	38	28	12	2	2	2	2	1	1	1/4"
30 x 84	240	30	84	50	28	12	2	2	2	2	1	1	1/4"

All dimensions in inches

ASME STANDARD VERTICAL AIR RECEIVERS

120, 200, 240 Gal.



		DIMENSIONS						Port size (NPT)					
Tank Size	Gal	A	B	C	D	E	F	3	4	5	6	7	8
30 X 46	120	30	46	7	7	7	12 1/2"	1/2" NPT Flat.Flange	2" NPT Rad.Flange	2" NPS Plug	1/4" NPT Flat.Flange	1" NPT Flat.Flange	1" NPT Rad..Flange
30 X 72	200	30	72	15	16	15	13	1/2" NPT Flat.Flange	2" NPT Rad.Flange	2" NPS Plug	1/4" NPT Flat.Flange	1" NPT Flat.Flange	1" NPT Rad..Flange
30 X 84	240	30	84	19	20	19	13	1/2" NPT Flat.Flange	2" NPT Rad.Flange	2" NPS Plug	1/4" NPT Flat.Flange	1" NPT Flat.Flange	1" NPT Rad..Flange

All dimensions in inches

AIRSWEEP® MAINTENANCE INSTRUCTIONS

Maintenance Requirements

Inspection of all components every 6 months is recommended for signs of wear or fatigue. Failure to perform routine inspections may result in sudden failure and possible contamination of material and/or damage to production equipment.

Isolation

Should it be necessary to overhaul any Airsweeps while the system is working, it will be necessary to first close the valve(s) isolating the Airsweep(s) on that part of the hopper. Next, switch on the Airsweep control system for one full cycle. This will allow compressed air to clear from all isolated pipes around the hopper, by cycling all Airsweeps within the system at least once.

CAUTION: to avoid injury, pressure must be relieved from header piping before maintenance is started.

Dismantling

Having first disconnected the electrical leads and the air piping, the Airsweep may be withdrawn by loosening hex setscrews or lock nut and removing Airsweep from mounting flange/plate or coupling.

(NOTE: mark Airsweep body to insure proper re-alignment with interior wall.)

At the work bench the solenoid valve should be unscrewed from the Airsweep.

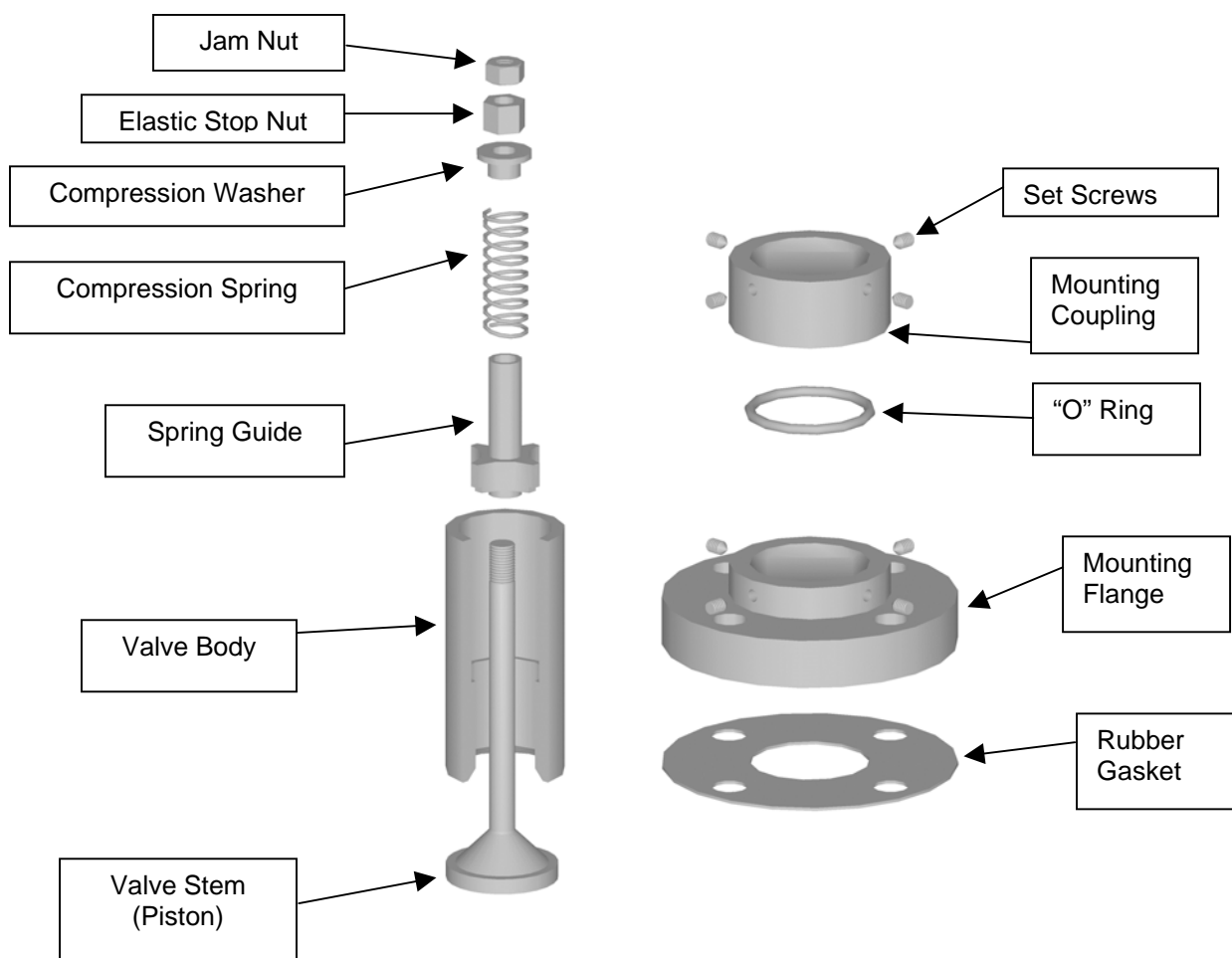
Holding the front of the valve cap in a vise, loosen and remove the jam nut and elastic stop nut from the valve stem.

The compression washer, compression spring, spring guide and valve stem can then be taken out. Inspect all parts for signs of wear or fatigue. Particularly note threads of the valve stem and the front seat of the valve cap. Replace worn or damaged parts.

Reassembly

Reassemble valve assembly. Tighten elastic stop nut to 3mm (1/8") of internal stop (front spring guide). Check 1/8" dimension by manually pushing on rear of valve stem to extend (front) cap from body. Reinstall jam nut, and tighten against elastic stop nut. Reassemble with solenoid and place back in hopper.

IMPORTANT: Front of Airsweep valve body must align with interior of hopper wall.



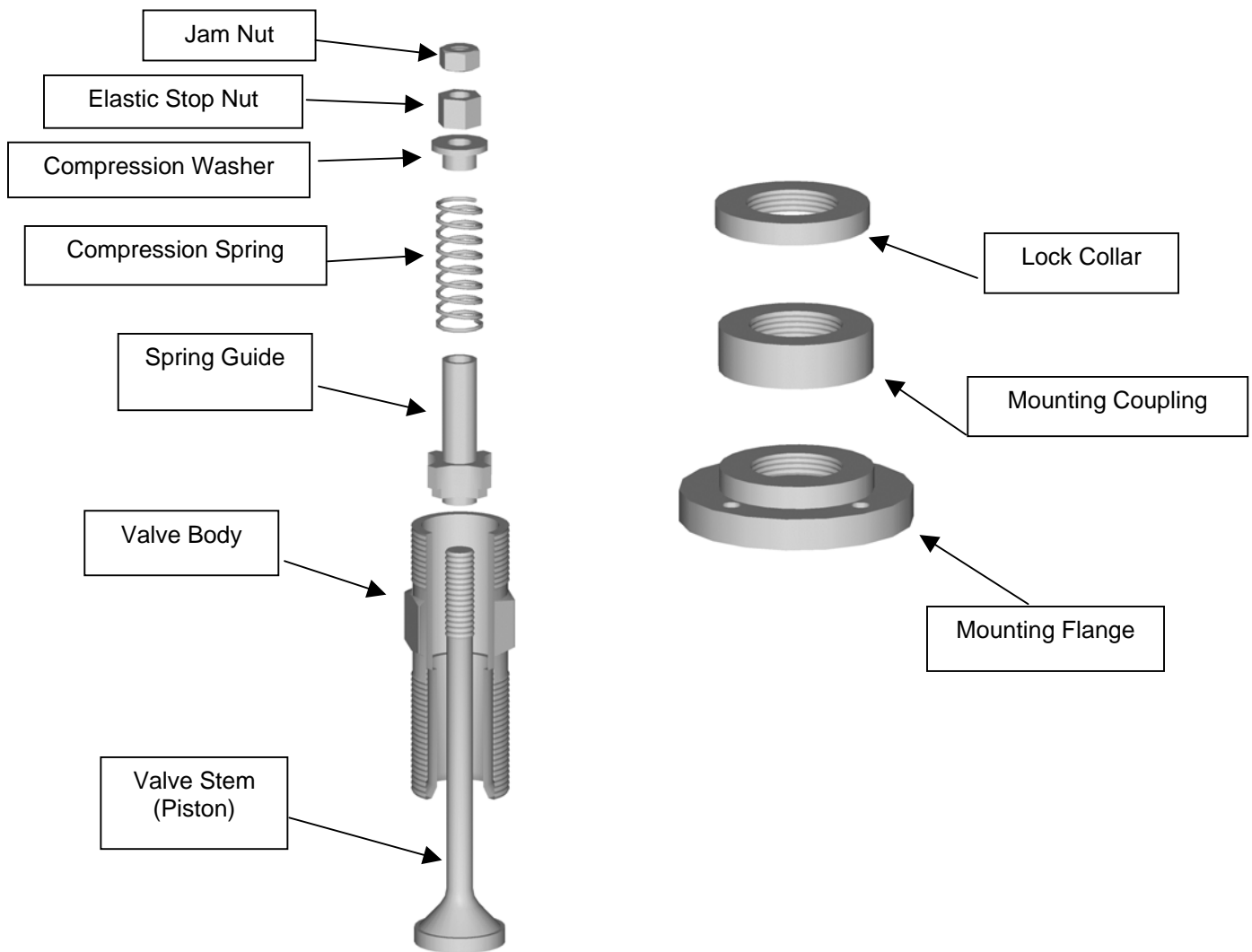
VA-51 Airsweep[®] assembly with mounting

Qty	DESCRIPTION	CARBON STEEL	STAINLESS STEEL
1	Valve Body	VB-51	VB-51-SS
1*	Valve Stem	VCW-51	VCW-51-SS
1*	Spring Guide	SG-51	SG-51-SS
1*	Compression Spring	CS-12/51	CS-12/51-SS
1*	Compression Washer	CW-12/51	CW-12/51-SS
1*	Elastic Stop Nut	ESN-12/51	ESN-12/51-SS
1*	Jam Nut	JN-12/51	JN-12/51-SS
1	Mounting Flange	MF-51	MF-51-SS
1	Mounting Coupling	MC-51	MC-51-SS
1	Rubber Gasket	RG-51	RG-51
1	O-Ring**	OR-51	OR-51

Note: (*) denotes part included in rebuild kit.

Order **RK-51** for carbon steel construction, **RK-51-SS** for stainless steel construction.

**For temperatures above 250° F, specify Viton O-ring (OR-51-V) .

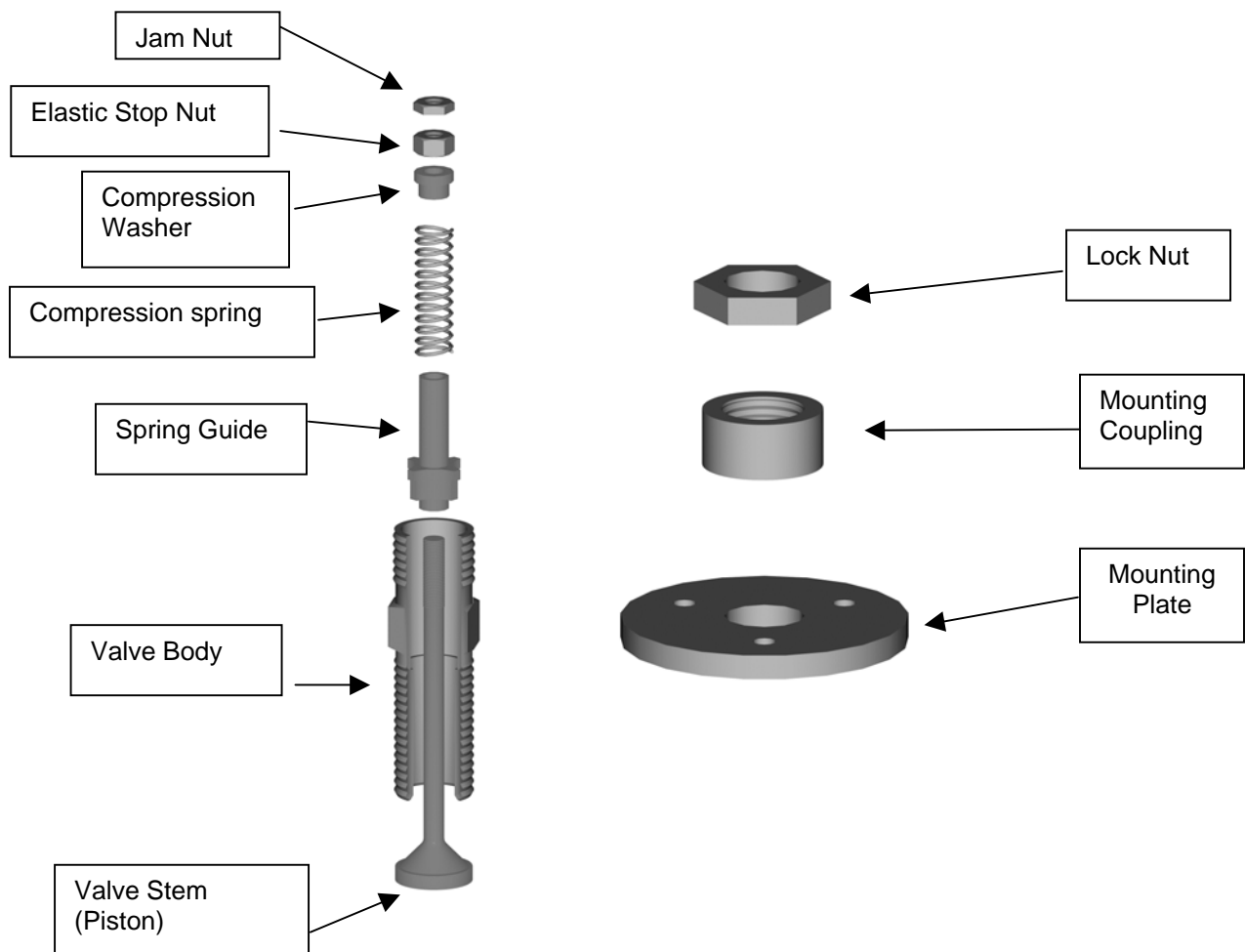


VA-12 Airsweep® assembly and mounting

Qty	Description	Part Number (carbon steel)	Part Number (stainless steel)
1	Valve Body	VB-12	VB-12-SS
*1	Valve Stem	VCW-12	VCW-12-SS
*1	Spring Guide	SG-12	SG-12-SS
*1	Compression Spring	CS-12/51	CS-12/51-SS
*1	Compression Washer	CW-12/51	CW-12/51-SS
*1	Elastic Stop Nut	ESN-12/51	ESN-12/51-SS
*1	Jam Nut	JN-12/51	JN-12/51-SS
1	Mounting Coupling	MC-12	MC-12-SS
1	Mounting Flange	MF-12	MF-12-SS
1	Lock Collar	LC-12	LC-12-SS

Note: (*) denotes part included in rebuild kit.

Order **RK-12** for carbon steel construction, **RK-12-SS** for stainless steel construction.



VA-06 Airsweep[®] assembly and mounting

Qty	Description	Part Number (carbon steel)	Part Number (stainless steel)
1	Valve Body	VB-06	VB-06-SS
*1	Valve Stem	VCW-06	VCW-06-SS
*1	Spring Guide	SG-06	SG-06-SS
*1	Compression Spring	CS-06	CS-06-SS
*1	Compression Washer	CW-06	CW-06-SS
*1	Elastic Stop Nut	ESN-06	ESN-06-SS
*1	Jam Nut	JN-06	JN-06-SS
1	Mounting Plate	MP-06	MP-06-SS
1	Mounting Coupling	MC-06	MC-06-SS
1	Lock Nut	LN-06	LN-06-SS

Note: (*) denotes part included in rebuild kit.

Order **RK-06** for carbon steel construction, **RK-06-SS** for stainless steel construction.

CBO-1 & CBO 1-220

Single output timer, for controlling *Airsweep*® systems

Installation

1. Mount the control or enclosure in any convenient location.
Direction of the control does not affect performance.
2. Connect power supply to terminals H & N (Neutral to N, High to H).
For CBO 1-220, connect L1 to H, L2 to N.
3. Connect one wire of solenoid (load) to terminal 4 (+).
Connect the remaining (common) wire from solenoid to terminal 3.
Output rating is 5 amps at 120 VAC (220 VAC, for CBO 1-220), maximum.

NOTE: Load circuit must be in place across terminals 3 and 4 for timer circuit to operate.

Remote Jog Function

Output can be instantly energized, and off time reset, via remote switch or relay by closing circuit between terminals 5 and 6. When circuit is re-opened, preset off-time timing will resume.

Adjustable Time ranges*

(standard, as supplied by factory - **other times available by special order**)

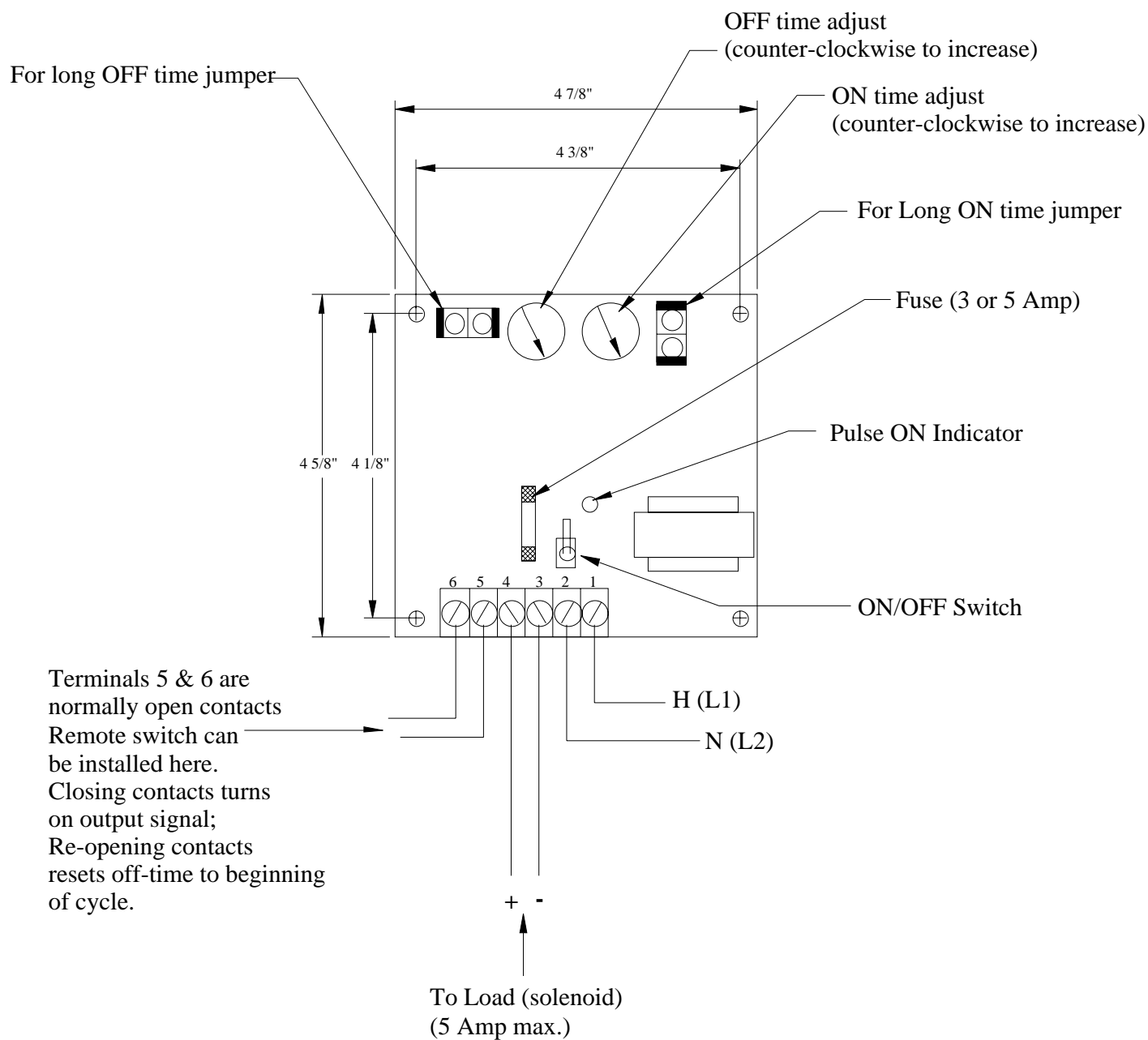
On time range:

30 milliseconds to 1.2 seconds;

Off (dwell) time range:

2 seconds to 2 minutes.

*OFF (dwell) time ranges can be extended by inserting a jumper on the spade terminals to the left of the OFF time adjustment potentiometer.



CBO 1 & CBO 1-220

Single Output Controller

Circuit board layout (not to scale)

Revised 11-00

CBO-4 & CBO-4-220

1-4 output sequence timer, for controlling *Airsweep*® systems

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 110/120 VAC, 50/60 Hz supply to terminals H & N.
For CBO4-220, connect 220/230 VAC, L1 to (N), L2 to (H).
3. Connect one wire of each solenoid (load) to terminals 1 - 4 (as required). Connect the remaining (common) wire from solenoid to terminal N.
Output rating is 3 amps at 115 VAC, maximum (3 amps at 230 VAC, for CBO 4-220).

Sequence

Output #1, then #2, and so on to last selected output.
Sequence will then repeat, beginning at output #1.
Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting total number of outputs

If less than 4 outputs are desired, remove the program jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the numbered position corresponding to the amount of outputs desired. Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable time ranges*

(standard, as supplied by factory)

On time range:

30 milliseconds to 1.2 seconds;

Off (dwell) time range:

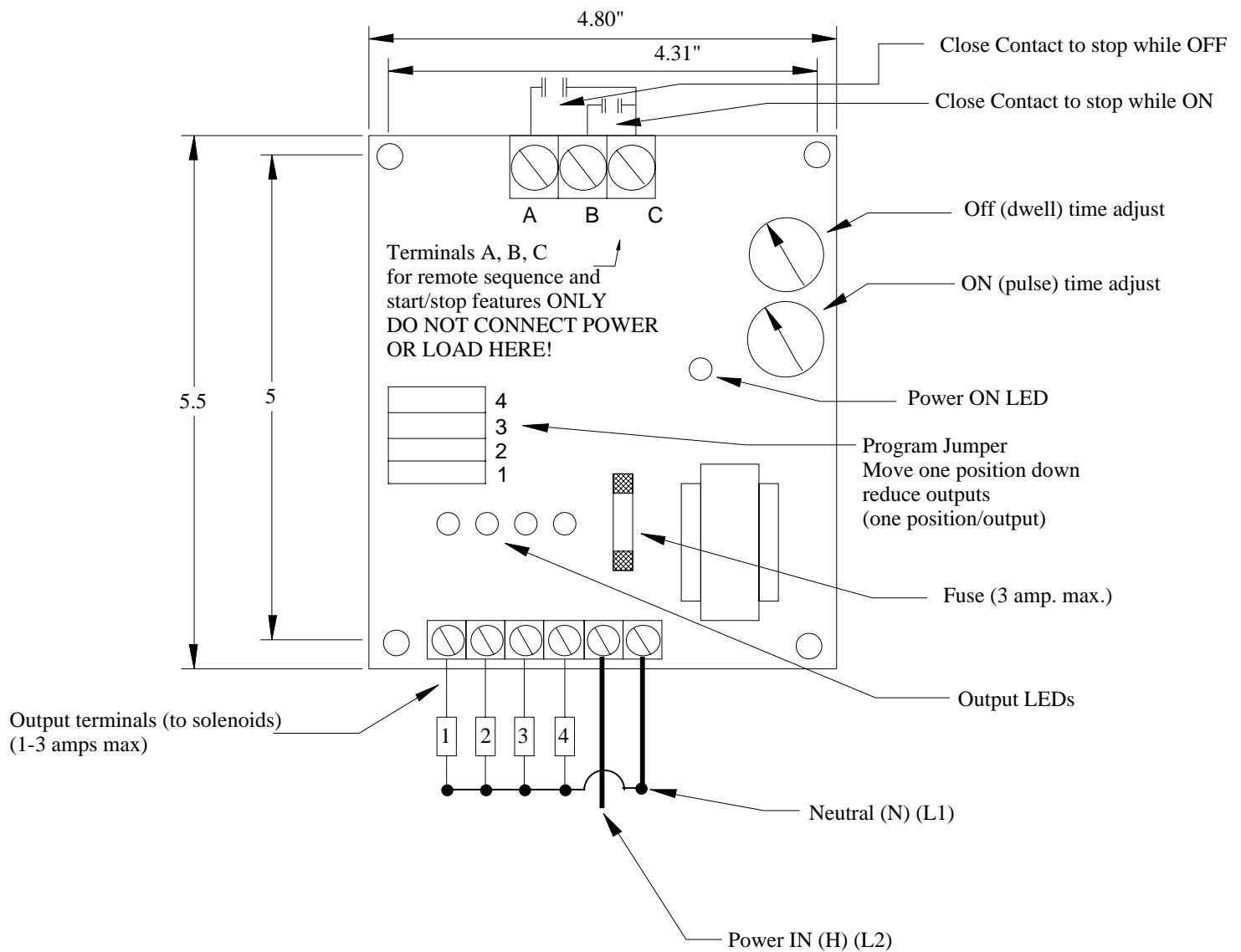
2 seconds to 2 minutes.

*OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.

16 VDC capacitor values and corresponding time ranges shown below.

Other times available by special order.

TIME RANGE	value (mfd)
16 - 600 Milliseconds	.1
30 Milliseconds to 1.2 seconds	.2
.1 to 6 seconds	1
.2 to 12 seconds	2.2
.3 to 20 seconds	3.3
1 to 60 seconds	10
2 seconds to 2 minutes	22
15 seconds to 10 minutes	100
30 seconds to 20 minutes	220
1 to 45 minutes	470



CBO-4 & CBO 4-220

1-4 Output Sequence Controller

Circuit board layout (not to scale)

Revised 11-00

CBO-10

10-Output sequence timer, for controlling *Airsweep*® systems

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 110/120 VAC, 50/60 Hz supply to terminals H & N.
For CBO 10-220, connect 220/230 VAC supply, L1 to H, L2 to N.
3. Connect one wire of each solenoid (load) to terminals 1 - 10 (as required). Connect the remaining (common) wire from solenoid to terminal N.
Output rating is 3 amps at 115 VAC, maximum (3 amps at 220 VAC, for CBO 10-220).

Sequence

Output #1, then #2, and so on to last selected output.
Sequence will then repeat, beginning at output #1.
Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting total number of outputs

Number of outputs is determined by the position of the program jumper, which is generally shipped in the #9 position. If 10 outputs are desired, the jumper should be removed. If less than 10 outputs are desired, remove the jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the

numbered position corresponding to the amount of outputs desired.

Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable time ranges*

(standard, as supplied by factory)

On time range:

30 milliseconds to 1.2 seconds;

Off (dwell) time range:

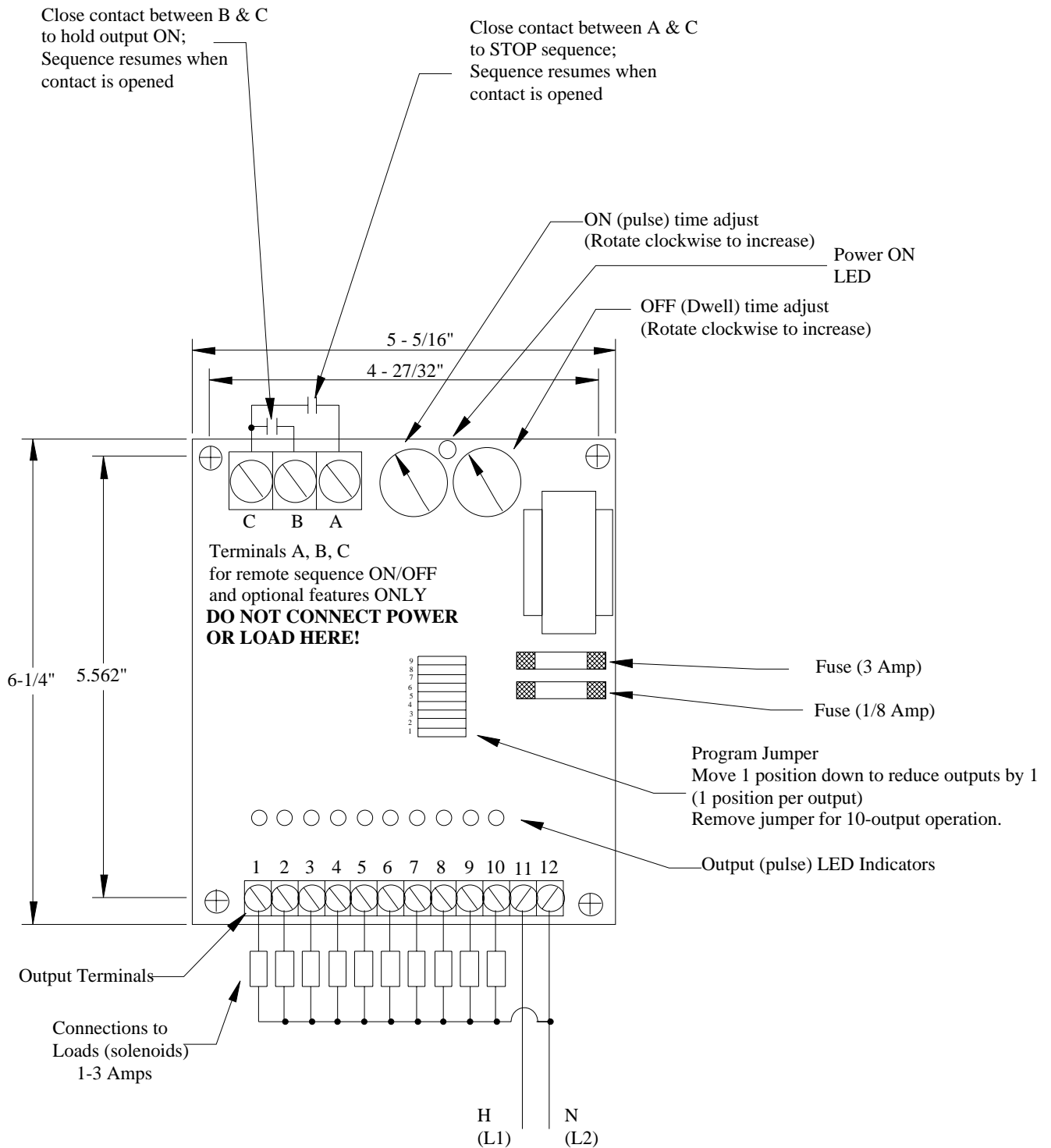
2 seconds to 2 minutes.

*OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.

16 VDC capacitor values and corresponding time ranges shown below.

Other times available by special order.

TIME RANGE	value (mfd)
16 - 600 Milliseconds	.1
30 Milliseconds to 1.2 seconds	.2
.1 to 6 seconds	1
.2 to 12 seconds	2.2
.3 to 20 seconds	3.3
1 to 60 seconds	10
2 seconds to 2 minutes	22
15 seconds to 10 minutes	100
30 seconds to 20 minutes	220
1 to 45 minutes	470



CBO-10 & CBO 10-220
2-10 Output Sequence Controller
 Circuit board layout (not to scale)
 Revised 11-00

CBO-4 (12/24 VDC)

1-4 Output sequence timer, for controlling *Airsweep*® systems

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 12 or 24 VDC supply to terminals H & N (Minus to -, Plus to +).
3. Connect one wire of each solenoid (load) to terminals 1 - 4 (as required). Connect the remaining (common) wire from solenoid to terminal (-).
Output rating is 5 amps at 12 or 24 VDC, maximum.
4. For 24 VDC, remove red jumper.

Sequence

Output #1, then #2, and so on to last selected output.
Sequence will then repeat, beginning at output #1.
Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting total number of outputs

If less than 4 outputs are desired, remove the Program jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the numbered position corresponding to the amount of outputs desired. Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable Time ranges*

(standard, as supplied by factory)

On time range:

30 milliseconds to 1.2 seconds;

Off (dwell) time range:

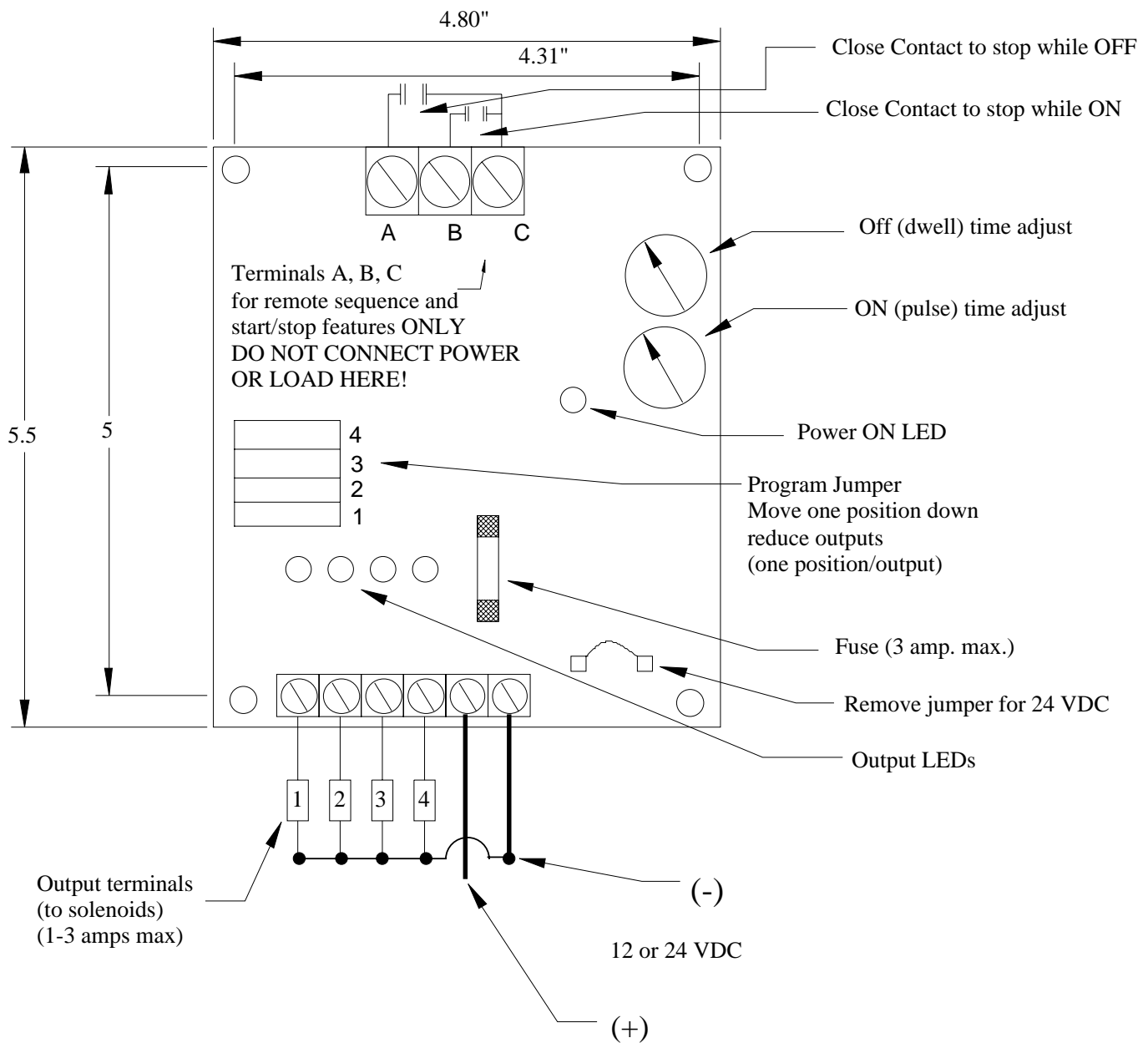
2 seconds to 2 minutes.

*OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.

16 VDC capacitor values and corresponding time ranges shown below.

Other times available by special order.

TIME RANGE	value (mfd)
16 - 600 Milliseconds	.1
30 Milliseconds to 1.2 seconds	.2
.1 to 6 seconds	1
.2 to 12 seconds	2.2
.3 to 20 seconds	3.3
1 to 60 seconds	10
2 seconds to 2 minutes	22
15 seconds to 10 minutes	100
30 seconds to 20 minutes	220
1 to 45 minutes	470



CBO-4 (12 or 24 VDC)
1-4 Output Sequence Controller
 Circuit board layout (not to scale)
 Revised 11-00

CBO-10 (12/24 VDC)

2-10 Output sequence timer, for controlling *Airsweep*® systems

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
 2. Connect 12 or 24 VDC supply to terminals 11 & 12 (- to 12, + to 11).
 3. Connect one wire of each solenoid (load) to terminals 1 - 10 (as required). Connect the remaining (common) wire from solenoid to terminal 12.
- Output rating is 5 amps at 12 or 24 VDC, maximum.
4. For 24 VDC, remove red jumper.

Sequence

Output #1, then #2, and so on to last selected output.
Sequence will then repeat, beginning at output #1.
Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting total number of outputs

If less than 10 outputs are desired, remove the program jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the numbered position corresponding to the amount of outputs desired.

Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable time ranges*

(standard, as supplied by factory)

On time range:

30 milliseconds to 1.2 seconds;

Off (dwell) time range:

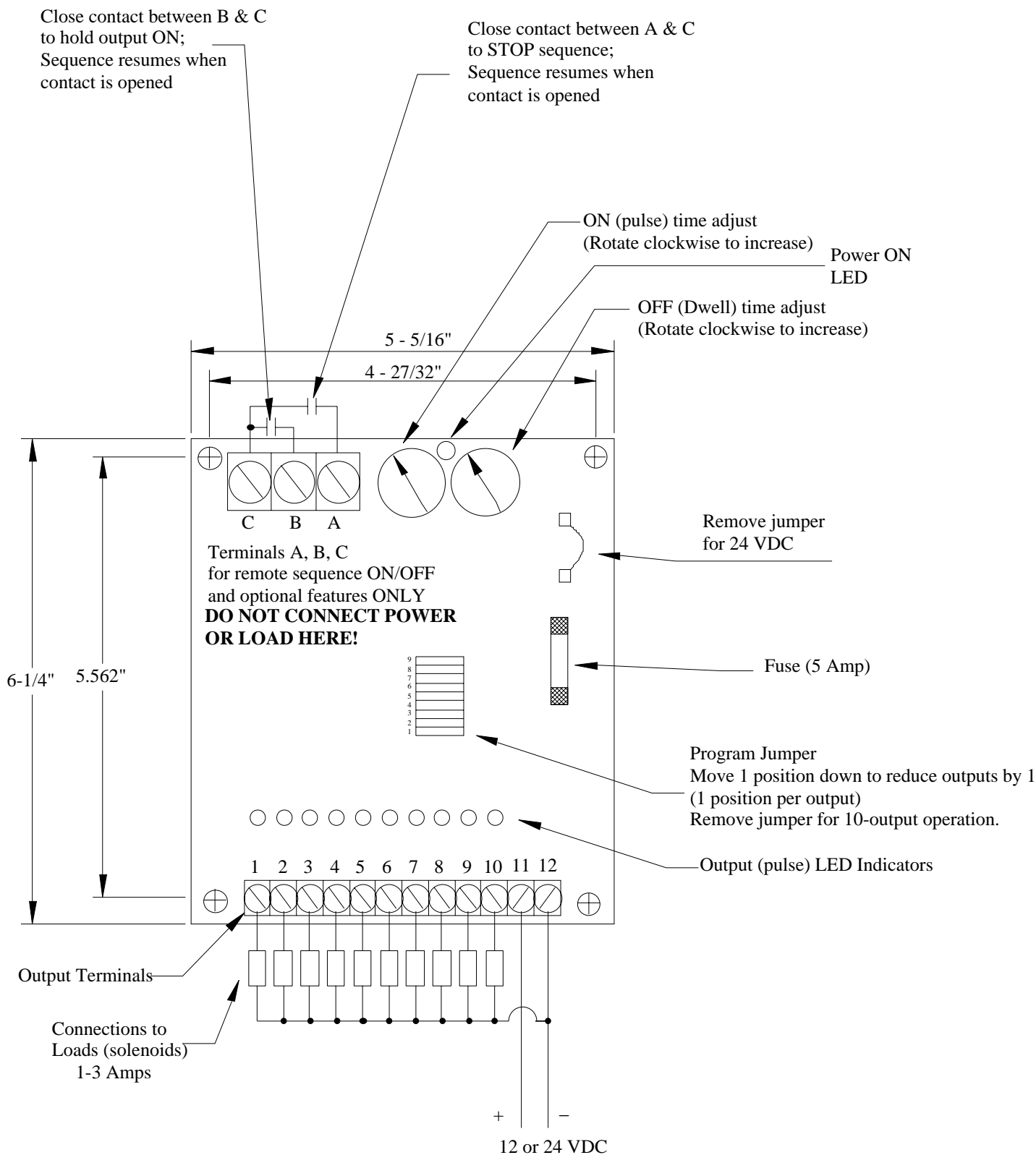
2 seconds to 2 minutes.

*OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.

16 VDC capacitor values and corresponding time ranges shown below.

Other times available by special order.

TIME RANGE	value (mfd)
16 - 600 Milliseconds	.1
30 Milliseconds to 1.2 seconds	.2
.1 to 6 seconds	1
.2 to 12 seconds	2.2
.3 to 20 seconds	3.3
1 to 60 seconds	10
2 seconds to 2 minutes	22
15 seconds to 10 minutes	100
30 seconds to 20 minutes	220
1 to 45 minutes	470



CBO-10 (12 or 24 VDC)
2-10 Output Sequence Controller
 Circuit board layout (not to scale) Revised 11-0

CBO 1-4 • CBO 4-4 CBO 10-4

Enclosure Specifications

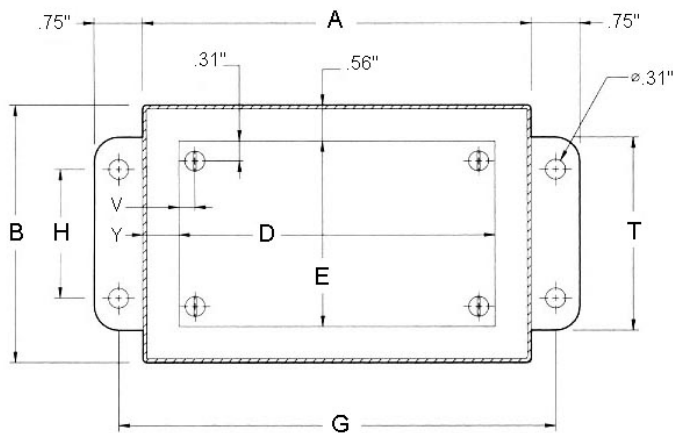
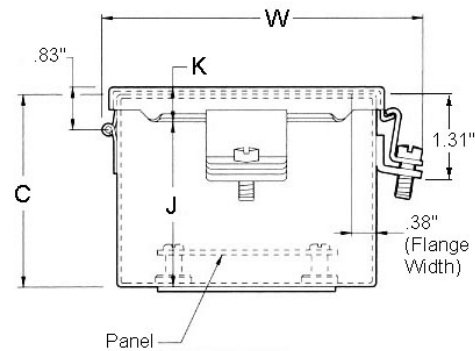
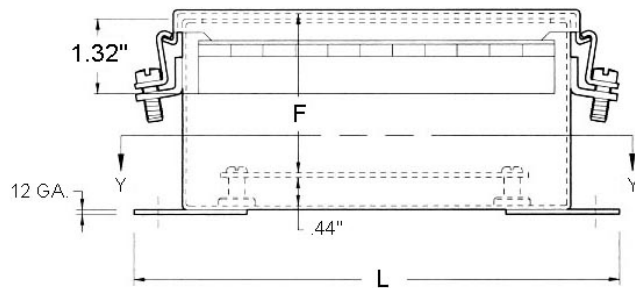
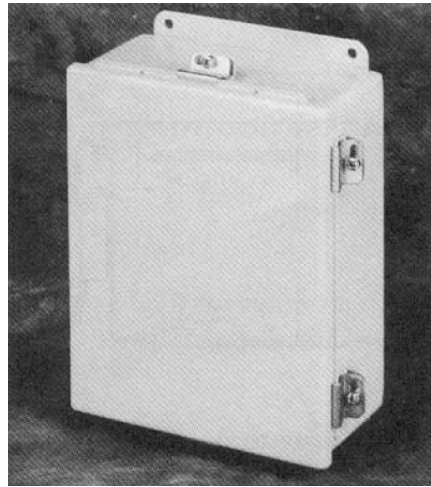
Suitable for indoor or outdoor use, wherever protection from dust, dirt, oil or hose-directed water is essential. 14 gauge steel construction, ANSI 61 gray polyester powder coating inside and out over phosphatized surfaces. Seams continuously welded and ground smooth. No holes or knockouts. Stainless steel clamps and hinge pin. Oil-resistant gasket and adhesive.

Meets industry standards UL 50 Type 4, 12 & 13.

NEMA/EEMAC Type 4, 12 & 13.

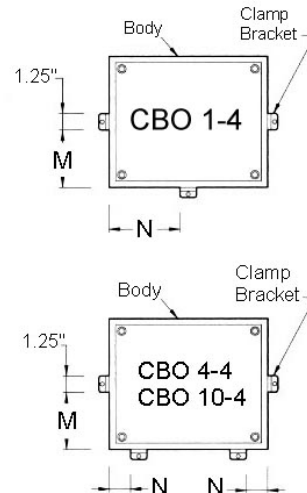
JIC standard EGP-1-1967.

CSA Type 4 & 12. IEC 529, IP66.



Section Y - Y

Clamp Bracket Locations



Model	A	B	C	D	E	F	G	H	J	K	L	M	N	T	V	Y
CBO 1-4	8	6	3.5	6.75	4.88	3.03	8.75	4	3.12	0.56	9.5	2.38	3.38	5	0.25	0.62
CBO 4-4 CBO 10-4	10	8	4	8.75	6.88	3.53	10.75	6	3.62	0.56	11.5	3.38	1.5	7	0.25	0.62

CBO 1-7/9XP • CBO 4-7/9XP

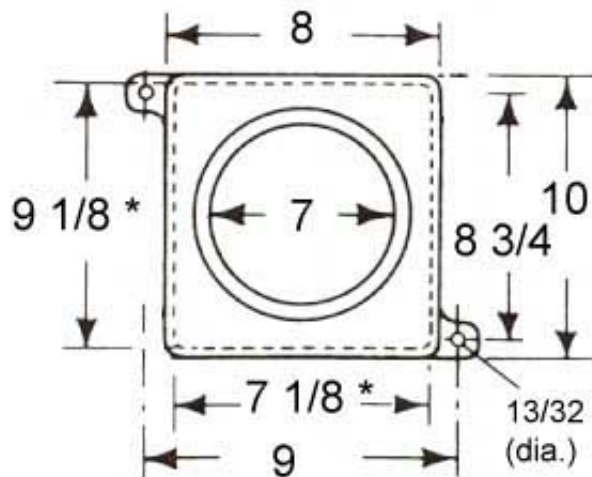
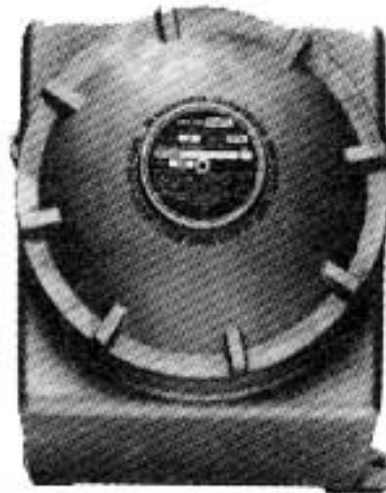
CBO 10-7/9XP

Enclosure Specifications

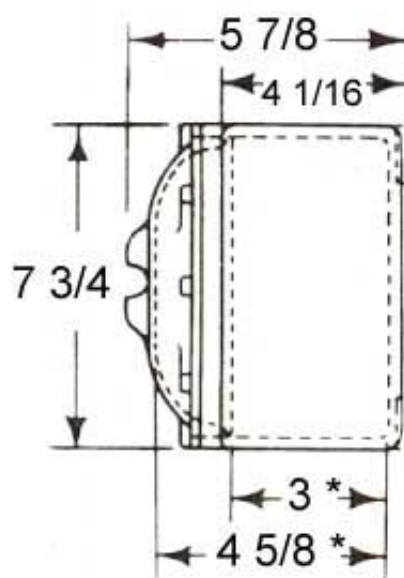
Suitable for indoor or outdoor use in hazardous areas. Body construction *Feraloy* iron alloy, electrogalvanized and aluminum acrylic paint finish. Cover construction copper-free aluminum, natural finish. Cover supplied with neoprene O-ring gasket to meet NEMA/EEMAC 4 requirements for watertight seal.

Meets: NEC/CEC Class I, Division 1 & 2, Groups B,C,D; Class II, Division 1, Groups E,F,G; Class II, Division 2, Groups F,G; Class III.

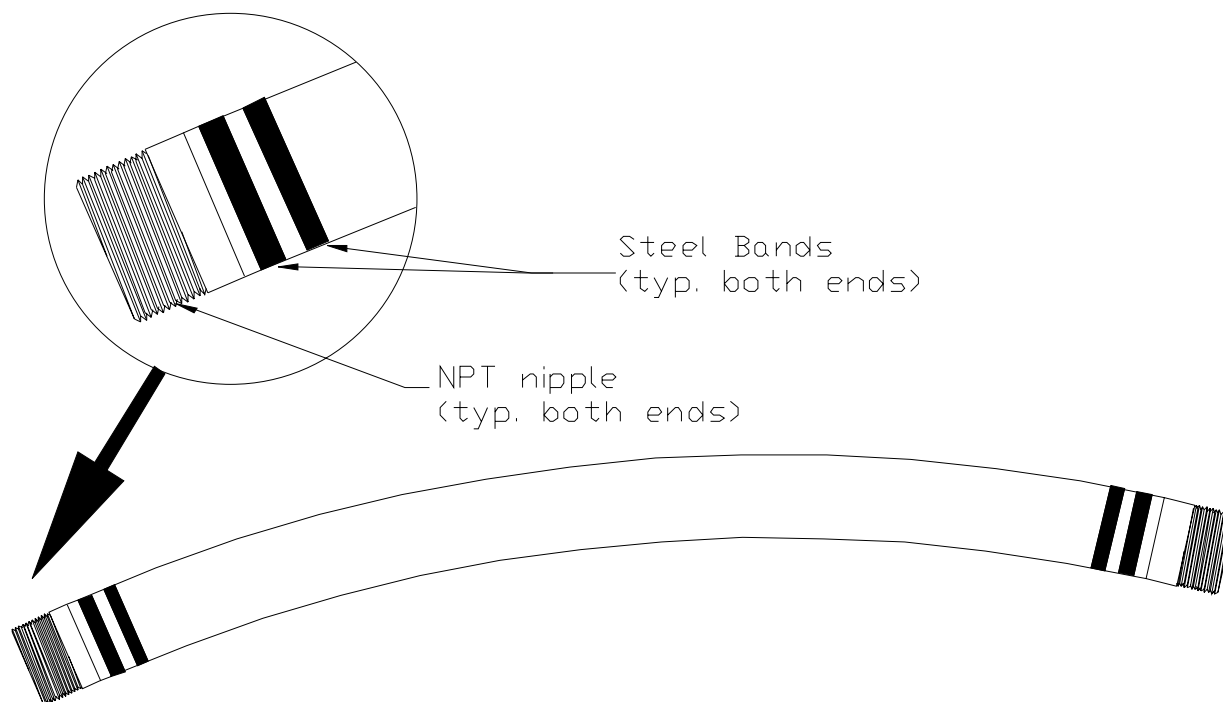
UL standard 886. CSA standard C22.2 No. 30. Explosion proof, dust-ignition proof, rain tight, wet locations, watertight. All dimensions in inches.



* = inside dimensions



1½" & ¾" Flexible Hose Assemblies



Specifications

1 ½" i.d. x 24" overall length

Tube: Black EPDM

Cover: Red EPDM

Reinforcement: Textile plies

Temperature Range: -40° F to 212° F

Working Pressure: 200 PSI

Meets RMA class C medium oil resistance, per ASTM D-471

Nipples: 1 ½" NPT, galvanized, double band clamps

¾" i.d. X 24" overall length

Tube: Black Nitrile

Cover: Red Neoprene

Reinforcement: Textile plies

Temperature Range: -20° F to 180° F

Working Pressure: 220 PSI

Oil resistant, non-conductive

Nipples: ¾" NPT, galvanized, double band clamps

UF-17 & UF-18 High Flow filters

General purpose filters used in compressed air systems to remove most solid and liquid particles from the compressed air.

Specifications

Fluid: Compressed air

Maximum pressure: 250 psig

Maximum temperature: 175°F

Port size: 2" NPT

Gauge ports (UF-18 only): 1/4" NPT

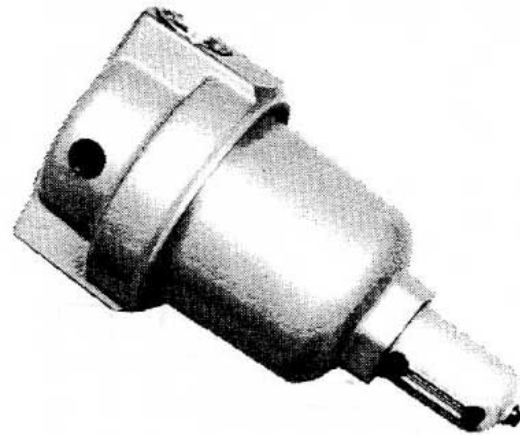
Auto drain connection: 1/8" NPT female

Filter element: 50 micron,
sintered bronze

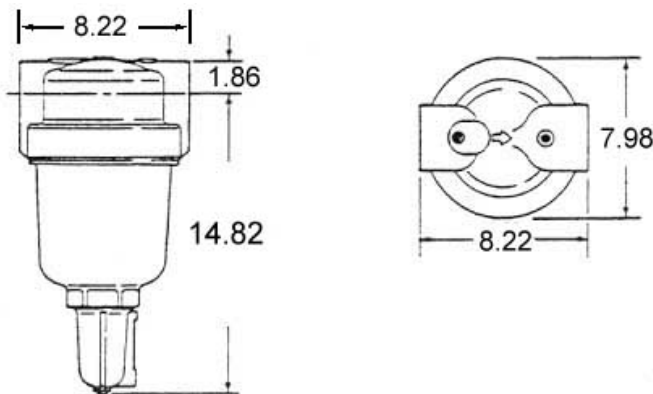
Body, intermediate body,
bowl construction: Aluminum

Elastomers: Neoprene and Nitrile

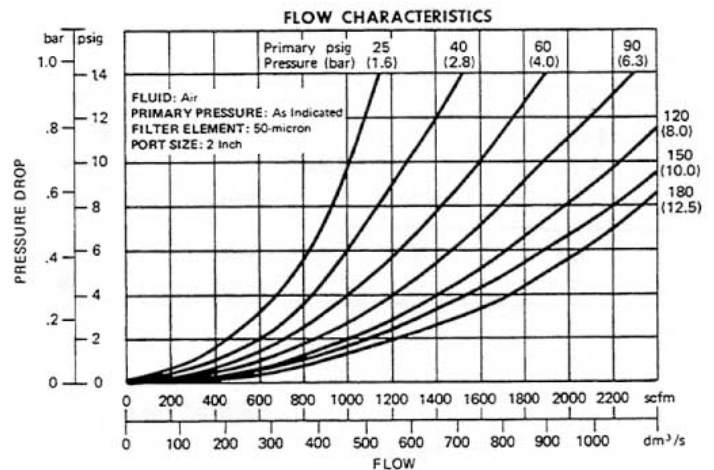
Bowl sight glass: Pyrex



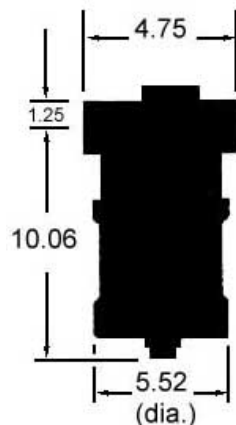
UF-18 Dimensions



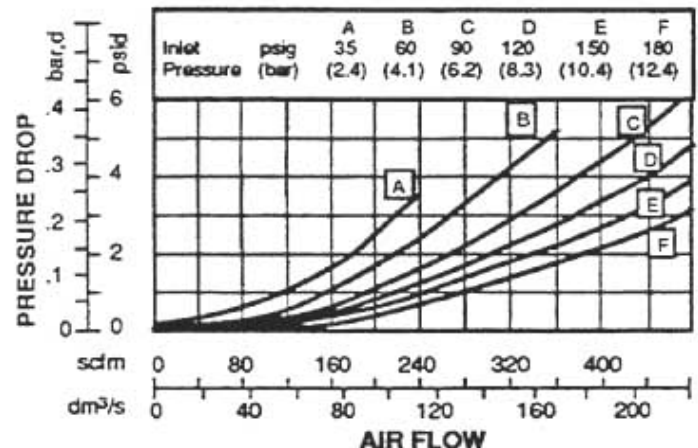
UF-18 Flow



UF-17 Dimensions



UF-17 Flow



Ball-Cone Check Valves

Models 61105 (1") & 61108 (2")

Reinforced ball-cone check and stainless steel springs, these valves offer exceptional resistance to chemicals and corrosion. No radial alignment is needed.

Features:

- 0.5 psi opening pressure
- Bronze construction (standard); stainless steel available
- Straight-through design minimizes flow changes

Dimensional Data

Model	Ports (NPT)	Length	Inlet (O.D.)	Outlet (O.D.)	Weight
61105	1"	3 1/2"	1 3/4"	1 15/16"	1 lb.
61108	2"	6"	3"	3 11/16"	7 lb.

Pressure/Temperature Ratings

°F	PSIG
-20 to 100	400
200	200
250	160
275	150
300	140
325	130
353	125